Emergency cash transfer programs, stigma, and access:

Factors in the prevention and treatment of child acute malnutrition

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Acute malnutrition puts over 50 million children at high risk of morbidity and mortality each year. Although treatment programs are efficacious, they neglect to address the condition's non-dietary causes and program coverage rates are estimated to be below 15%. Interest in multi-sectoral approaches for the prevention and treatment of acute malnutrition has grown rapidly over the last decade; rigorous evidence regarding the impact of such approaches is lacking. The objectives of this dissertation were to (1) examine the role of emergency cash transfer programs (CTPs) in the prevention of acute malnutrition, and (2) to determine whether stigma associated with acute malnutrition limits access to treatment programs.

We used a longitudinal dataset from a cohort of 453 children and households targeted by an unconditional emergency CTP in Maradi, Niger, to identify factors associated with the risk of developing acute malnutrition during a food crisis in 2012. We then used data from a quasi-experimental study of a conditional emergency CTP in Tahoua, Niger, to evaluate its impact on child diet and weight gain during the same period, comparing 212 beneficiary children to 212 concurrent controls. Finally, we conducted a cross-sectional survey of 711 caregivers attending health facilities in Marsabit County, Kenya, to assess barriers to accessing treatment for children with acute malnutrition.

In Niger, our longitudinal study indicated that health and wealth-related factors were significant determinants of acute malnutrition risk. Diet-related factors and food expenditures were not associated with risk. Our quasi-experimental study revealed remarkable improvements in the diet and weight gain of beneficiary CTP children relative to controls. In Kenya, caregivers of acutely malnourished children were significantly more likely than others to report shame as a barrier to accessing treatment.

We conclude that emergency CTPs have great potential to prevent acute malnutrition in contexts similar to the 2012 food crisis in Niger, although their ability to influence the health environment or to compensate for chronic poverty appears limited. Access to treatment for acute malnutrition is likely constrained by stigma in addition to a number of other well-established access barriers. There is a need for further critical evaluation of emergency CTPs as well as mechanisms to identify and reduce the sources of acute malnutrition-related stigma.

BIOGRAPHICAL SKETCH

Jessica Robin Bliss grew up in Wisconsin, Alabama, and Oregon. She attended the University of Oregon, graduating *summa cum laude* with a Bachelor's of Science in Environmental Science in 2005. She served as an AmeriCorps volunteer in Oregon and as a Peace Corps volunteer in Niger before matriculating at Cornell University in 2010.

DEDICATION

This work is dedicated to the residents of Foloa, Niger.

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Chapter 1: Introduction

Significance

Recently termed the "everyday emergency", acute malnutrition affects 50-70 million children each year, results in the deaths of over one million, and is a significant public health problem in both emergency and non-emergency settings (1,2). Despite the widespread adoption and integration of an efficacious treatment (CMAM) into national health systems, the global burden of acute malnutrition only declined by 11% between 1990 and 2011 (2). Efforts to improve treatment efficacy, integrate and promote prevention across multiple sectors, prioritize acute malnutrition on national and global agendas, and expand program coverage are all necessary for reaching a meaningful and sustainable decline in the burden of acute malnutrition. The research reported in this dissertation makes two significant contributions to programmatic and theoretical understandings of how acute malnutrition may be prevented and treated: it describes the remarkable capacity that emergency CTPs can play in the prevention of acute malnutrition in humanitarian settings, and it reveals that the stigmatization of acute malnutrition may be a relevant factor limiting the access and coverage of CMAM in the context of routine health programming.

Background

Conventional models for the prevention and treatment of acute malnutrition

Acute malnutrition occurs as a result of infection, disease, and/or restricted dietary intake, which lead to reduced appetite, limited nutrient absorption, the loss of nutrients through diarrhea or vomiting, and subsequent wasting (3). Although the condition is typically viewed as a feature of rapid-onset emergency settings, half of the overall burden of cases are estimated to occur in chronic non-emergency contexts (2,4). Each year, approximately 51.5 million children experience moderate acute malnutrition (MAM) and 18.7 million experience severe acute malnutrition (SAM)[1]; roughly 11% of children under the age of 5 are affected annually (1).

Conventional approaches for preventing and treating acute malnutrition are primarily food-based and consist of referral to supplementary (for MAM) or therapeutic (for SAM) feeding programs, with the intent to promote weight gain and return affected children to a healthy growth trajectory (4-6). Typically, both supplementary and therapeutic programs are delivered as part of routine child health and nutrition services through Ministry of Health platforms and are jointly referred to as the Community-based Management of Acute Malnutrition (CMAM). In emergency settings, such as following a natural disaster, in conflict zones, or in cases of severe famine, feeding programs are temporarily scaled-up or initiated in partnership with international humanitarian organizations (7).

[1] MAM is defined as a weight-for-height Z-score (WHZ) < -2 and ≥-3, or a mid-upper arm circumference (MUAC) <115 and ≥125mm. SAM is the more severe condition, defined by a WHZ <-3, MUAC <115mm, or the presence of bilateral pitting edema.

Whereas previous models for SAM treatment relied on inpatient care, CMAM is operated almost exclusively on an outpatient basis, thanks to the advent, effectiveness, and proliferation of non-perishable and ready-to-eat foods for treatment (RUFs) (6). Although calls for decentralizing acute malnutrition treatment away from hospitals came as early as the 1970s, CMAM didn't replace inpatient care as the dominant model until the mid 2000s (8-10). Since then, CMAM has lead to remarkable achievements in the coverage, efficacy, and cost-effectiveness of treatment for acute malnutrition (11-15). Cure rates of acutely malnourished children who receive prompt CMAM care are estimated to be as high as 80% (15).

Yet even in light of CMAM's achievements over the last decade, supplementary and therapeutic feeding programs are criticized for the inadequate nutritional composition of supplementary food staples and their reliance on internationally sourced supplementary foods and RUFs (5,6,16). They are also subject to perpetuating a 'food first' bias, among beneficiaries and implementers alike, which overlooks the relative importance of morbidity and the health environment (2,17). Simultaneously, CMAM coverage often fails to meet international standards for humanitarian action, which require at least 50% of eligible children to be covered in rural areas (15,18). Recent work by the Coverage Monitoring Network estimated the global coverage[2] of SAM treatment to be less than

[2] Coverage is the ratio of the number of individuals receiving treatment relative to the number of individuals eligible for treatment. In situations where the prevalence of a condition is unknown, or where screening for the condition and/or referral for treatment is poor, coverage is difficult, if not impossible, to estimate.

15% (15), and studies of supplementary feeding programs have consistently reported MAM treatment drop-out rates as high as 80% (19).

Emergent approaches for the prevention and treatment of acute malnutrition

The vast majority of current acute malnutrition research involves the development of new feeding protocols. Examples include experimentation with the composition of RUFs (milk, whey, peanut butter, etc.) (20-22), the intensity of intervention delivery, the efficacy of RUF relative to flour-based interventions (23,24), the use of RUFs for prevention in addition to treatment among at-risk populations (25-28), and the feasibility of local RUF production (29).

While there is no doubt of the necessity of food-based interventions for the prevention and treatment of acute malnutrition, there is increasing interest in the feasibility and effectiveness of non-food complements or alternatives. The importance of multidisciplinary approaches to child health and nutrition has long been recognized, but integrated efforts have only recently been linked directly to acute malnutrition (2). For instance, the use of antibiotics in conjunction with RUF for the treatment of SAM in Malawi was associated with faster weight gain, quicker recovery rates, and lower mortality (30). In Bangladesh, psychosocial stimulation provided alongside routine inpatient care and outpatient follow-up resulted in improved child development and growth (31). And in Niger, Myanmar, and the Philippines, cash transfer programs have been used to curb food insecurity and the incidence of acute malnutrition during humanitarian crises (32). In **Table 1.1**, we present a chronology of events in the history

of acute malnutrition research and practice, highlighting both conventional and emergent approaches.

TABLE 1.1 Key events and phases in the history of the prevention and treatment of acute malnutrition [1]

Year	Key events	Phases of research and practice
1971	Inpatient treatment of SAM was criticized for high burden on caregivers and health system (8).	SAM treatment is predominantly inpatient.
1995	Nutriset began to develop ready-to-use therapeutic food.	
1999	The WHO released guidelines on the management of SAM with no mention of outpatient care (33).	
2001	The Lancet published an article by Steve Collins, outlining the basic principles and protocol of what will become CMAM (10).	
2000	Humanitarian organizations and governments began to experiment with at-home treatment of SAM in Malawi, Ethiopia, and Niger (34-37).	CTPs are predominantly implemented in non-emergency settings for the purpose of
2004	Emergency CTPs began to appear with increasing regularity in humanitarian contexts.	
2006	The Lancet published an article by Steve Collins, highlighting a pressing need for global adoption of CMAM (9).	
2007	The WHO stated that uncomplicated cases of SAM can be treated on an outpatient basis. The prevention of acute malnutrition is highlighted.	SAM treatment is predominantly outpatient, delivered through CMAM.
2012	The first review of emergency CTPs was published, based on humanitarian evaluations(32).	CTPs are increasingly used for the prevention of acute malnutrition in emergency settings.
2013	WHO issued new guidelines for SAM care: uncomplicated cases should receive special high-energy foods and antibiotics, and should be treated at home.	
2013	The Coverage Monitoring Network reported that less than 15% of children with SAM receive treatment.	Interest in multi-sectoral interventions, prevention, and program coverage increases.
		The treatment of acute malnutrition using food-based approaches is emphasized over prevention, with limited collaboration across sectors.

[1] SAM = severe acute malnutrition. WHO = World Health Organization. CMAM = Community-based management of acute malnutrition. CTP = Cash transfer program.

Emergency cash transfer programs: an emerging tool for preventing acute malnutrition

Cash transfer programs (CTPs) are a compelling example of an intervention with new applications in the prevention of acute malnutrition. A brainchild of the socio-economic field, CTPs have been implemented in long-term, non-emergency settings for decades as a means of investing in human capital to promote measurable and sustainable poverty reduction (38). Emergency CTPs have become increasingly common tools in a range of humanitarian crises, implemented in response to social and political conflicts (Sudan), natural disasters (Myanmar), and recurring seasonal effects (Niger), with the common objective of protecting child health and nutrition during periods of disrupted access to food, water, shelter, and/or basic services (32). The underlying assumption in most emergency CTPs is that a meaningful amount of the transfer will be spent on food, which is presumed to translate into improved child dietary intake and subsequent reductions in the rate of acute malnutrition for the duration of the crisis (32). This assumption prevails despite the proliferation of evidence that increases in income are not sufficient to influence child nutritional status (39-41).

Some insight into whether and how emergency CTPs may impact child nutrition can be gained from non-emergency CTPs, for which conceptual frameworks for program impact are fairly well developed (**Figure 1.1)** (42). Non-emergency programs have been associated with favorable child nutrition outcomes in several Latin American countries, including reductions in anemia (Mexico), low birth weight (Mexico), underweight (Brazil and Nicaragua), and stunting (Mexico, Nicaragua, Brazil) (43-45). They are consistently associated with improved uptake of health services (46-48), immunization coverage (49),

and dietary diversity (38). However, a recent meta-analysis of sixteen long-term CTPs found their weighted average impact on child stunting to be effectively zero (50), and there is no evidence of reliable impact on micronutrient status (51,52). Programs with unclear participant guidelines, small transfers, or poor adherence have limited or no impact on any outcome measure (38,53).

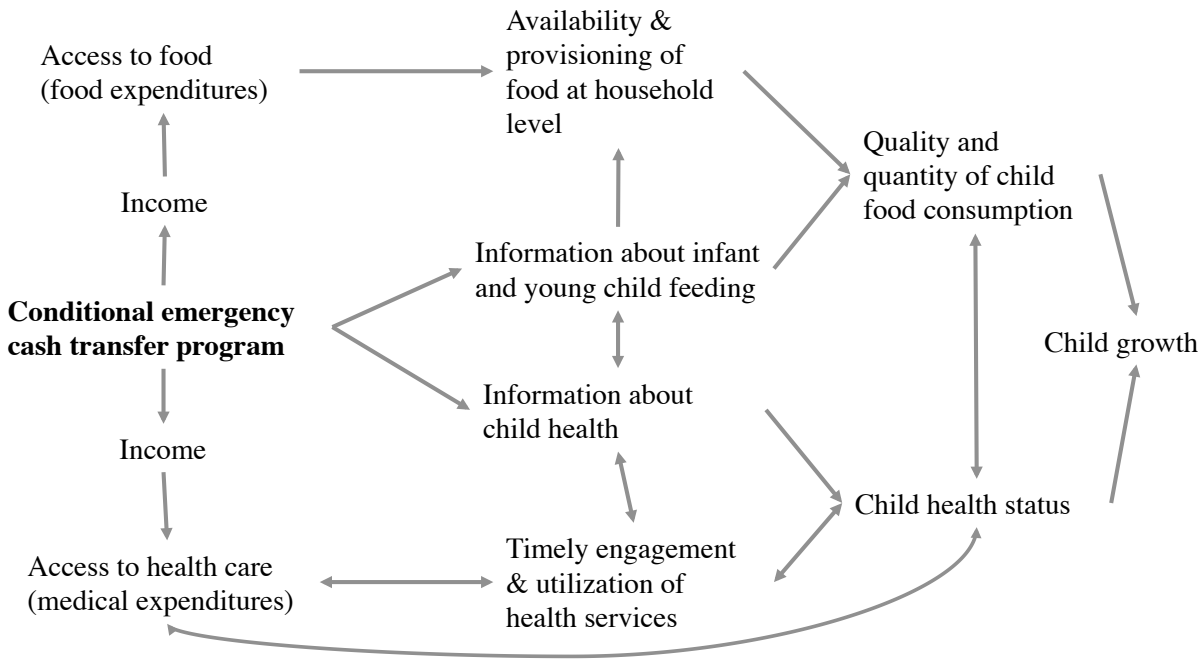

FIGURE 1.1 How a conditional emergency cash transfer program can impact child growth. Figure is adapted from work by Gaardner (2010) (42) and Leroy (2009) (51).

The impact of non-emergency CTPs on child health and nutrition outcomes is mixed and difficult to estimate, likely due to confounding by differences in program design, transfer amount and frequency, and context (54). The generalizability to emergency CTPs is additionally limited by the vastly different objectives, timeframes, and implementation constraints faced by CTPs operating in humanitarian crisis contexts. Whereas non-emergency programs are structured with the long-term goal of poverty alleviation, emergency programs address an immediate need for an abbreviated period of time.

Furthermore, the availability and quality of evidence regarding the impact of emergency CTPs is limited by a number of logistic and ethical considerations. First, due to the unpredictable and urgent nature of the context in which emergency cash transfer programs are most relevant, implementing organizations may sacrifice strategic monitoring and evaluation methods in favor of rapid program execution (7). Second, in circumstances where the need for assistance is high, it is typically considered unethical to deny program benefits to eligible populations, limiting organizational capacity to assess program impact using concurrent controls. And third, the pressure on implementing agencies and donors to produce and report positive program results for crisis-affected communities cannot be overlooked as a potential source of bias in the publication of emergency CTP evaluations, which currently comprise the bulk of available evidence.

Turning to the available literature on emergency CTP impact, a recent review of internal humanitarian agency evaluations indicated an improvement in child diet quality and nutritional status (wasting) across a range of crisis types in Myanmar, Niger, Somalia,

and South Sudan (32). One study of an emergency CTP in Niger determined that beneficiaries of the program made gains in child weight-for-height Z scores (WHZ), mid-upper arm circumference (MUAC), and dietary diversity, as well as improved household indicators of wealth and food security; the study did not have a comparison group so improvements could not be attributed to the intervention (55). Recent work by the International Food Policy Research Institute (IFPRI) offered the first glimpse at rigorous evaluation; through the use of a randomized design in Niger and Ecuador to compare transfer modalities—cash transfer, in-kind, and food vouchers—they found food baskets resulted in larger gains in household dietary diversity and food security status than cash transfers, but did not report impacts on child-specific indicators (56,57). A summary of recent outcomes from emergency CTPs and short-term non-emergency CTPs is presented in Appendix A (Table A1).

Expansion of coverage for existing approaches to the treatment of acute malnutrition

Expanding the arsenal of interventions is just one tactic for addressing the burden of acute malnutrition; an additional tactic is the expansion of CMAM access and coverage. As found with many maternal and child survival services, CMAM access and coverage are thought to be limiting factors of program effectiveness and impact (58,59). Poor coverage of and access to acute malnutrition treatment programs is a challenge in spite of the increases in coverage that should be afforded by the CMAM approach (15,60). Nonetheless, most studies of acute malnutrition have paid little attention to coverage, focusing instead on documenting medical outcomes such as weight gain, survival,

recovery, and relapse (7).

Review of the extensive body of literature on the coverage of child health services in low-income settings highlights the relevance of women's time and financial constraints, in addition to a lack of awareness of treatment options and eligibility, as difficult obstacles to overcome when seeking care (61). A table summarizing the findings of this literature can be found in Appendix A (Table A2). Research specific to CMAM access and coverage consists of one published study spanning six Sub-Saharan African countries and a three-part series of reports produced by the Coverage Monitoring Network. In a review of CMAM programs in Niger, Ethiopia, North and South Sudan, Malawi, and the Democratic Republic of the Congo in the mid 2000s, the fear of rejection, not recognizing the child's condition as malnutrition, lack of confidence in the program, relapse, and distance to the site of program were the most common reasons for not utilizing treatment services (60).

The Coverage Monitoring Network, a nonprofit organization that began monitoring the global coverage of CMAM since 2012, recently produced a three-part series summarizing global access issues related to SAM treatment over the last two years (15,62,63). They collaborated with CMAM implementers in 21 countries to survey caregivers of children with untreated SAM regarding barriers to accessing care. Their main findings—that the primary treatment barriers were a lack of knowledge of malnutrition, lack of knowledge

about CMAM, high opportunity costs, and distance to site—are consistent with knowledge about access barriers for other child health services (62).

Stigma as a barrier to access and coverage of CMAM

The stigmatization of health conditions has been documented in several contexts and is a potentially relevant and unidentified barrier to CMAM access. Erving Goffman's seminal essay in 1963 described stigma as the relationship between a dehumanizing, "deeply discrediting" attribute and a stereotype (64). The subsequent decades of stigma research were characterized by the use and application of socio-cognitive perspectives, emphasizing individuals' perceptions about stigma and the consequences of these perceptions in social interactions (65). Contemporary conceptualizations of stigma incorporate a more complex consideration of the dynamic social, economic, and political contexts and processes that both produce and intensify discrimination (66).

Link and Phelan (67) offer a comprehensive framework for conceptualizing stigma that includes both the socio-cognitive and structural aspects of stigma. They describe stigma as the convergence of labeling, stereotyping, separation, status loss, and discrimination in the context of a situation with a clear power differential (67,68). Thus, for stigmatization to occur, (1) individuals must distinguish differences between each other and label those differences, (2) the labeled differences must be linked to a set of undesirable characteristics or negative stereotypes, (3), the labeled people or groups must be categorized as separate, forming a sense of "us" versus "them", and (4) status loss and

discrimination must ensue at the expense of the labeled group (67). Discrimination may be individual, in which a person takes overt discriminatory action against another; structural, in which social or institutional norms perpetuate inequalities; and/or self-imposed, in which an individual devalues themselves and expects stereotyping and discrimination to occur (67,68).

Self-imposed discrimination, also called identity threat, has dominated stigma research for the last decade (68). Steele and Aronson first proposed the theory of identity threat in 1995 under the name "stereotype threat", proposing that members of stigmatized groups experience "situationally based fear that one will be judged on the basis of [negative] stereotypes" (68,69). This concept is similar to the theory of "stigma consciousness", in which members of a stigmatized group anticipate a stereotype and expect discrimination (70). Overt discrimination does not necessarily take place in the case of self-imposed discrimination—rather, self-identifying as a member of a stigmatized group, devaluing oneself, and the expectation of discrimination are the key components of this form of discrimination.

A key aspect of the current conceptualization of stigma is the role of power, which enables a community "to move from individual level perceptions to collectively identify an undesirable attribute, construct stereotypes, and ultimately, to act on the negative stereotype by discriminating against the stigmatized" (65). Link and Phelan (66,67) explain that for stigma to result in discrimination, the stigmatized group must be at the lower end of a power differential. Although labeling, stereotyping, and separation also

take place against groups in power, status loss and discrimination do not occur because the lower-status groups lack the cultural, economic, and/or political power to influence status or enact discriminatory measures of consequence.

How stigma is created [1]	Responses to stigma [2]	Consequences for health [3]
1. Labeling of human differences 2. Separation by labeled differences 3. Negative stereotyping of labeled differences 4. Status loss 5. Discrimination • Individual to individual (avoidance, rejection) • Structural (institutional and societal norms) • Self-imposed (shameful perception of self, expectation of individual or structural discrimination)	Voluntary: • Withdrawal • Self-exclusion • Overcompensation Involuntary: • Anxiety • Depression • Hypertension	• Non-disclosure of status • Denial of status • Care avoidance • Delayed treatment • Permanent disability • Death

FIGURE 1.2 Conceptualizing stigma and its consequences for health. [1] Link and Phelan (2001) (67). [2] Keusch (2006) (74), Major and Obrien (2005) (68). [3] Keusch et al. (2006) (74) and Nyblade et al. (2009) (78).

For well known stigmatized health conditions, such as HIV/AIDS, tuberculosis, and epilepsy, stigma has proven a formidable barrier to accessing medical treatment (65,71-73). Individuals with stigmatized conditions may invoke a number of voluntary and involuntary coping strategies; the former include denial of their health status, delayed care-seeking, avoidance of care, and in severe cases, permanent disability or death (**Figure 1.2**) (74). Involuntary responses to stigma include depression, anxiety, and stress (68,75).

Stigma has been documented in association with acute malnutrition in a number of settings. In Pakistan in the late 1980s, women expressed the belief that child wasting meant that the mother had behaved immorally and was being punished by evil spirits; women whose children were wasted described not leaving the house due to concerns over judgment (76). In Tanzania, stigma associated with poverty was tightly associated with child malnutrition and invoked feelings of shame and exclusion from the health system (77). Stigma and insecurity were detected in a few instances as noted in the Coverage Monitoring Network reports described previously (60,62). And, lastly, during the author's service as a Peace Corps volunteer in Niger, women with children with untreated SAM expressed reluctance to seek CMAM due to feelings of shame about the child's condition.

Context

Chapters 2 and 3: Studies of emergency CTPs in Niger

The national Government of Niger declared an impending food crisis in May 2012, based on drought and famine early warning system projections of poor crop and fodder production due to insufficient rainfall. High food prices were seen as a key contributing factor to the crisis (79). Similar circumstances in Niger in 2004-2005 and 2008-2009 had proven devastating, with several million people believed to be affected by crop failure, the inability to afford market-sourced foods, severe food security, and perilously high levels of child acute malnutrition and mortality (80-82). These events led to international calls for enhanced governmental and humanitarian agency response to threats of famine in the country and region (83).

Save the Children and Concern Worldwide are two international nonprofit humanitarian agencies with long histories of providing child health and nutrition support in emergency settings around the world. In 2012, they each implemented emergency CTPs in separate regions of Niger in response to the government's declaration of a food crisis.

Chapter 4: Assessment of access barriers in Kenya

Approximately 291,000 people inhabit Marsabit County, Kenya; most residents are of Borana or Gabra ethnicity and practice pastoralism or agro-pastoralism (84). The region is subject to recurrent droughts and chronic food insecurity, and conflict between the dominate ethnic groups over livestock, land, and water rights is frequent (85). Marsabit

County has few roads and limited infrastructure for education, communication, and health services.

In 2012, Concern Worldwide began a USAID Child Survival Grant-funded project to reduce maternal, infant, and child morbidity and mortality among women and children in Marsabit County, Kenya. Increased access to maternal and child health services was a primary objective of the project, yet Concern Worldwide and its Ministry of Health partners lacked current, context-specific information about access barriers in Marsabit County. This situation provided an opportunity to research both the universal access barriers faced by beneficiaries of the child survival program as well as those barriers that may be unique to CMAM beneficiaries, with particular attention to the role of stigma.

Innovation

Chapters 2 and 3

In their budding application as tools in emergency settings, CTPs show promising yet poorly evidenced impact for enhancing child health and nutrition status. The high cost[3] and the increasing frequency of emergency CTP use raise important questions about their effectiveness and cost-effectiveness, and demands more rigorous evaluation than what currently exists. To date, few studies of emergency CTPs have had the resources or data

[3] To get a sense of cost: the CTP program described in Chapter 2 provided transfers worth 390 USD each to 2,736 households, for a total of 1,076, 040 USD in a 6-month period. The program in Chapter 3 administered transfers worth 250 USD to 6,497 households over a 3-month period, for a total of 1,624,350 USD. Administrative, implementation, or evaluation costs are not included in these totals.

to test assumptions about how or whether emergency CTPs might work. The research for this dissertation begins to fill this gap by contributing findings from two novel studies of emergency CTPs implemented by international nonprofit humanitarian agencies in Niger.

In the Maradi region, Save the Children collaborated with the Emergency Nutrition Network (England), an international nonprofit specializing in intervention evaluation, to design and implement a thorough monitoring and evaluation protocol among a random subsample of beneficiaries. This protocol involved the most extensive data collection to take place for an emergency CTP to date, including detailed collection of food and medical expenditures for children, overall household expenditures, child diet, health, and anthropometric indicators, and a host of caregiver and household characteristics. These data are novel in that they provide the first opportunity for a critical analysis of the factors associated with the development of acute malnutrition in the context of an emergency setting. An analysis of these data is reported in Chapter 2.

In the Tahoua region, Concern Worldwide similarly upgraded their approach to CTP evaluation, in this case collecting data on non-enrolled households in addition to a subset of program beneficiaries. To our knowledge, this is the only study to make use of a true control group in the evaluation of an emergency CTP, thus making a significant contribution to our understanding of whether and how such programs impact child nutrition. The circumstances that made the use of a concurrent control possible and ethical, as well as an analysis of the data collected, are described in Chapter 3.

The findings of Chapters 2 and 3 contribute new knowledge of the capacity of emergency CTPs to influence child diet and nutrition outcomes, as well as a better understanding of their role alongside other tactical nutrition and food security programs.

Chapter 4

While there are ample studies that look at barriers to health service utilization for single health conditions (pre-natal services, diarrhea, pneumonia, malaria, etc.), there are none that take a comprehensive or comparative view of multiple disease states or services. Therefore, it is unknown whether the many barriers identified are specific to disease states, their respective treatment demands, or simply reflective of general barriers to access in the context studied. Furthermore, the relationship between stigma and acute malnutrition has not been systematically investigated as a potential barrier to accessing CMAM since CMAM became a prominent intervention in child nutrition and health services.

No single mechanism can be universally applied to make child health and nutrition programs such as CMAM more wide reaching: context-specific solutions are required that address the unique barriers to acceptable and sustainable coverage rates (86). Without strong evidence for context-specific, demand-side access barriers, efforts to increase coverage are unlikely to succeed (87). The research in Chapter 4 challenges existing health service implementers and theorists to take into account the different obstacles that caregivers face depending on the specific condition of their child by

providing a comprehensive understanding of access barriers for CMAM compared with other child health services.

Summary of dissertation

The overall goals of this research were to (1) examine the role of one emergent, non-food intervention, the emergency cash transfer program, in the prevention of acute malnutrition, and (2) to identify and describe unique barriers associated with accessing the treatment of acute malnutrition, with particular attention to stigma.

We examine the role of food and diet-related factors and health-related factors in the development of acute malnutrition, using data from a longitudinal cohort study of 453 children aged 6-36 months in households receiving an unconditional emergency CTP in Maradi, Niger (Chapter 2). The program, designed by the Emergency Nutrition Network and implemented by Save the Children, was expected to reduce risk by increasing food availability to beneficiary children. The cohort data did not allow a test of this expectation as there was no comparison group, but they did provide an opportunity to see if the association between acute malnutrition and food/diet related factors was diminished in the presence of the CTP.

We also present an assessment of the impact of Concern Worldwide's conditional emergency CTP in Tahoua, Niger, on the growth and diet of 212 beneficiary children aged 6-24 months (Chapter 3). The study design included a comparison group of 212 non-beneficiary children, which allowed us to estimate the portion of weight and WHZ

gain attributable to the intervention. We consider the importance of the conditional terms of this program, which emphasized child feeding and care practices.

The focus of Chapter 4 is the potential role of stigma in limiting access to treatment for acute malnutrition for children in Marsabit County, Kenya. We used survey data from interviews with 711 women at eighteen rural health facilities, each of whom had a child aged 6-59 months. Children were either of normal nutritional status (n=189), had MAM (n=159), or had SAM (n=163), allowing us to identify access barriers that were universal across the group and those that were unique to caregivers of children with acute malnutrition.

The fifth and final chapter includes a consideration of the consistency of findings between our studies of emergency CTPs—including discussion of the programmatic and methodological differences that explain the seemingly divergent findings, and a discussion of the limitations that such programs may face in addressing child morbidity. We also explore the current imbalance of research in the field of acute malnutrition, which favors the development of new product and protocol development over expanded access and coverage of existing interventions.

Chapter 2: Factors associated with the risk of acute malnutrition among children aged 6-36 months in households targeted by an emergency cash transfer program

Authors

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Abstract

Emergency cash transfer programs (CTPs) are promising nutrition-sensitive interventions for the prevention of acute malnutrition. Identifying how the expenditure of cash transfers relates to child nutrition status is a necessary step for informed program design and targeting. We investigated the relationship between cash transfer expenditures and acute malnutrition in children aged 6-36 months through an observational cohort study of 420 households enrolled in a six-month unconditional emergency CTP in Niger. A Cox proportional hazards model was used to estimate the risk of acute malnutrition while adjusting for relevant child, household, and community characteristics. Seventy-four children (18% of the cohort) developed acute malnutrition. The risk was 1.79 times higher among ill children than healthy children (HR: 1.79; 95%CI: 1.10, 2.92; P<0.05), nearly 3 times higher among children in the poorest households than those in wealthier households (HR: 2.98; 95%CI: 1.86, 4.78; P<0.001), and 2.85 times lower with each unit

increase in baseline weight-for-height Z score (HR: 0.35; 95%CI: 0.23, 0.53; P<0.001). Among recipients of this CTP, food expenditures and diet-related factors did not appear to have a protective effect against the risk of acute malnutrition. The significance of wealth and health-related factors suggests that a potential role of emergency CTPs is to enable medical access for ill children. The timing of emergency CTPs is an important factor in reaching at risk children, but even timeliness may not compensate for persistent poverty and undernutrition.

Background/Introduction

Despite a renewed global focus on improving child health and nutrition, acute malnutrition affects at least 52 million children annually (1). It impairs immune function, reduces appetite, increases metabolic rate and nutrient needs, and heightens vulnerability to infection and disease (3). Children with moderate or severe acute malnutrition have two- to nine-fold greater odds of dying from pneumonia, diarrhea, or malaria than children without acute malnutrition. Ultimately, wasting is responsible for 875,000 child deaths each year (1,9).

The determinants of child undernutrition vary with context, and require flexible and variable approaches for effective prevention and treatment. Conventional approaches to preventing and treating acute malnutrition typically address immediate food-based causes through referral to blanket and targeted supplementary or therapeutic feeding programs, with the objective of promoting weight gain and returning affected children to a healthy

growth trajectory (1,4). While food-based approaches remain at the core of programs for treating acute malnutrition, cash and voucher-based programs are increasingly being considered as viable preventive options. Cash transfer programs (CTPs), in which cash is distributed to vulnerable households, have emerged as nutrition-sensitive options to address the underlying determinants of undernutrition (52,88).

Differences in CTP design, implementation, transfer amount and frequency, conditionality, and setting make evaluation of the impact(s) of CTPs difficult; consequently, observed effects on child nutrition and health outcomes are mixed (52,54). Most evidence of CTP impact comes from programs implemented over a prolonged period of time—usually several years—in politically and environmentally stable settings, often in Latin American countries. In these settings, CTPs have been associated with lower rates of child mortality, low birth weight, and anemia (Mexico), diarrhea (Colombia and Mexico), and stunting (Brazil, Colombia, Mexico, and Nicaragua), and they are consistently associated with increased utilization of health services (46,54). However, a recent meta-analysis of sixteen programs found their weighted average impact on child stunting to be essentially zero, and concluded that no evidence for an impact on acute malnutrition is currently available (50).

The use of CTPs in emergency settings is growing, particularly in African countries. Emergency settings are characterized by substantial logistic challenges, an immediate need to prevent human suffering and save lives, and the decision to seek humanitarian assistance (7). The available evidence for CTPs in such settings is limited and relies

heavily on routine program evaluations by implementing nonprofit agencies. These evaluations indicate an association with reductions in the prevalence of acute malnutrition in several contexts (Myanmar, Niger, Somalia, and South Sudan) (32). In both stable and emergency settings, CTPs have shown consistent associations with improved dietary quality and increased food expenditures (32,38,52). One recent study by the International Food Policy Research Institute (IFPRI) offers the most rigorous evidence to date: their findings from a randomized study of cash and in-kind transfers in Niger show that while CTPs were more cost-effective to implement, recipients had less diverse diets and poorer household food security outcomes than recipients of food baskets (57).

High quality evidence and empirical understanding of how emergency CTPs are utilized, how they compare to other modalities of providing humanitarian assistance, and how they might influence child nutrition outcomes are urgently needed (49,56,89). This longitudinal study examined the association of food and health-related expenditures on children's risk of acute malnutrition, and estimates the effects of other potentially relevant child, household, and community characteristics among households targeted by an emergency CTP. A pre-post analysis of moderating factors within the causal framework for undernutrition from the same program has been published elsewhere (55).

Methods

Setting

Niger's population of 16 million is largely reliant on rain-fed agriculture and experiences extreme food insecurity on an annual basis. Most rural households in the study region of Maradi are supported through a combination of subsistence farming, unskilled manual labor, livestock husbandry, and the selling of commodity items such as firewood, charcoal, or small goods. The prevalences of stunting and wasting among children under five years of age in Maradi are 54% and 19%, respectively; this is higher than the national rates (44% and 18%) (90). At 166 deaths per 1,000 live births, child mortality in Maradi is lower than the national rate of 198 deaths per 1,000 live births (90). Acute malnutrition is most prevalent during an annual period of food insecurity, the rainy "lean season", between June and October.

Intervention

In May 2012, Save the Children (hereafter "Save") implemented a six-month unconditional, emergency CTP in the Maradi region of Niger in response to the Government of Niger's declaration of an impending food crisis. Program objectives were to improve household food security, prevent the sale of household assets, and reduce the incidence of child wasting. Eligible households were those classified as either "poor" or "poorest" according to the Household Economy Approach (HEA) (91). The HEA defines wealth groups according to locally defined thresholds of land and livestock ownership and household size. In the study context, the "poorest" households had

approximately seven household members and owned less than one hectare of land, no cattle, and no more than two goats and four hens. "Poor" households, in contrast, had approximately eight household members and owned approximately 1.5 hectares of land, no cattle, and no more than three goats and eight hens (92).

A total of 2,736 households in 21 villages were enrolled in the program and received six monthly cash transfers from April to September 2012. Save staff distributed the transfers at public distribution sites. The transfer amount started at 20,000 West African Francs (CFA) for each of the first two months of the program and 30,000 CFA for each of the subsequent four months, for a total value of 160,000 CFA (296 USD using July 2012 exchange rates (44,93)). The total was equivalent to approximately 76% of the Gross National Income (GNI) per capita in Niger in 2012 (210,810 CFA, or 390 USD) (32,94). The median total weekly household expenditures (the sum of food, medical, and other expenditures) among the study sample at baseline were 2,100 CFA (inter-quartile range: 1,450-3,350), or approximately 11% of the starting transfer amount.

Educational sessions did not accompany the intervention. All participants had access to the same medical and nutritional services that existed prior to the study, which would have included supplementary and therapeutic feeding programs for qualifying individuals. Such programs are integrated into routine Ministry of Health services.

Study design and eligibility

The Emergency Nutrition Network (ENN), a UK-based research and information-sharing humanitarian organization, designed and implemented a six-month longitudinal cohort study of children in Save CTP beneficiary households. Households were randomly selected from the Save list of CTP beneficiaries, and one eligible child per household was selected as the target child for the study. Children were eligible if they were 6-36 months of age and did not have acute malnutrition, defined as a weight-for-height Z-score (WHZ) <-2 using the World Health Organization (WHO) standards for child growth (95), a mid-upper-arm circumference (MUAC) <125mm, or edema, in April 2012. Eligibility did not discount participation in other health or livelihood programs. In households with more than 1 eligible child, all eligible children's names were written on folded pieces of paper and one was randomly selected as the target child.

Planned sample size

The sample size for this study was designed for a different purpose than the analysis presented here, making ours a secondary data analysis. Post-hoc power calculations appropriate to Cox proportional hazards models are provided in the results section. The study's sample size was calculated to detect a 25% decrease in the prevalence of acute malnutrition relative to the prevalence during the previous year's lean season (26% in August 2011). Power was set at 80% with 95% two-sided confidence intervals. Correlation of repeated measures was estimated at 0.6; a Spearman's rank correlation coefficient of 0.015 was used. The minimum sample size after adjusting for clustering (n=21) and 5% attrition was 460 child-household pairs.

Data collection

Data on child diet, health and anthropometric status, and household expenditures were collected at the homes of study participants for six consecutive months, from April (baseline) to September (endline) 2012. Data on household composition, education, income, and assets were collected only at baseline and endline. Interviews with thirty-four female beneficiaries, seventeen with an acutely malnourished child and seventeen with a non-acutely malnourished child, were conducted and recorded to collect qualitative data on program delivery and uptake. All data were collected in the Hausa language in the week prior to the cash transfer distributions by ten teams of three enumerators each (one team leader and two individuals to measure and record data). A copy of the survey tool is available in Appendix B (Supplement B1).

Any target child diagnosed with acute malnutrition (a "case") at any survey round was referred to treatment services. Their household remained a beneficiary of the CTP, but no further data was collected from the target child or the household until the endline survey.

Model variables and measurement

All variables are continuous unless otherwise noted. Child anthropometric measurements were made using standard techniques, applying Standardized Monitoring & Assessment of Relief & Transitions (SMART) guidelines (96). The Emergency Nutrition Assessment (ENA) software was used to test both inter- and intra- measurer reliability during training and refresher training (59,97,98). Weight was recorded to a precision of 0.1kg using an electronic baby/toddler scale (Tanita BD-590, USA). Length of less than 87cm was

measured to a precision of 1mm using a baby mat (SECA S210, UK); height of children ≥ 87 cm was measured using a plastic stadiometer (Leicester, Child Growth Foundation, UK). A tape was used to measure MUAC on the left arm to a precision of 0.1 cm. The presence of bilateral pitting edema was recorded. Moyo[4] weight-for-height charts were used to assess and interpret a child's weight-for-height according to the 2006 WHO growth standards (95). Age was determined by asking to see a birth certificate or by asking the mother directly or, if not known, it was estimated using a local events calendar. Exact dates of birth were known for 281 children in the study (62%).

Child dietary diversity was assessed by summing the total number of WHO food groups consumed within the last 24 hours (grains/tubers, fruits and vegetables rich in vitamin A, legumes/nuts, animal flesh foods, eggs, dairy, and other fruits/vegetables) (99,100). Child meal frequency was the number of snacks or meals fed to the child within the last 24 hours. Breastfeeding status was assessed by asking whether the child had received breast milk in the preceding day (0, no breast milk fed; 1, breast milk was fed). Current consumption of supplementary or therapeutic foods by the target child was also documented (0, no supplement; 1, received supplement).

Child illness was defined as the occurrence of any of the following five symptoms or diseases within the previous two weeks as observed by the mother: diarrhea, cough, fever, malaria, or measles (0, healthy; 1, recently ill). Maternal mental health was assessed using the Self-Reporting Questionnaire, which scores mental health from 0 to

[4] Moyo charts are named for the nutrition center in Blantyre, Malawi, where the chart was developed.

19, where 0 is no symptoms and 19 is all elicited symptoms of poor mental health (19,101).

Expenditures on food, medical, or other expenses were estimated by participants for the previous one week, and are expressed in units of 100 CFA (approximately 19 cents using July 2012 exchange rates (62,93)). Estimates were for expenditures related to the target child only. "Other" expenses included the cost of materials such as clothing, cloth, soap, or any non-food, non-medical expense incurred for the target child.

Household size was the number of family members currently living in the household. Education referred to the presence of any individual in the household with formal (primary or secondary) education (0, no formal education; 1, formal education). Participants estimated the time to the nearest health facility in minutes. Discrete categories of time to health facilities did not appear in the data, so the variable was left continuous and log-transformed for modeling. Protected water sources were covered wells or pumps, while unprotected sources were open wells or bodies of water (0, protected; 1, unprotected). Household food insecurity was assessed using a shortened validated version of the Household Food Insecurity Access Scale (HFIAS) (102). The scale was dichotomized for analysis (0, no indicators of household food insecurity; 1, at least 1 indicator of food insecurity). We categorized household wealth using the HEA system as described in intervention section above (0, "poor"; 1, "poorest).

Informed consent and approval

Study participants gave verbal and written informed consent at each month of data collection and were free to leave the study at any point. Study procedures were in accordance with Save's routine program monitoring and evaluation protocols. Any target child found to have acute malnutrition was referred to treatment and removed from the study; the household remained a beneficiary of the CTP. This study was approved by the Niger Ministry of Health.

Statistical Methods

Data were double entered into EpiInfo Version 7 (103) by two data-entry clerks on the day after data collection and analyzed using the STATA statistical software package version 12 (104). Anthropometric indicators of the attained growth standards were calculated using the WHO macro for STATA (105). A quality check of the anthropometric data using the ENA plausibility software declared the data to be of "good" quality (98).

We used a continuous-time Cox proportional hazards model to estimate the risk of acute malnutrition based on fixed and time-variant variables, using month as the underlying time variable. Cox proportional hazards models estimate the effect of covariates on the likelihood of an event (becoming acutely malnourished in this case) relative to a common underlying risk function; it is the appropriate modeling approach for right-censored data with time-dependent covariates (106).

Model construction

Our binary outcome variable was the diagnosis of acute malnutrition. We began model construction by selecting explanatory variables with theoretical significance to child undernutrition as identified by the UNICEF framework (107). The initial model included sixteen explanatory variables representing the immediate, underlying, and basic causes of undernutrition. We then used a backward elimination approach to remove variables that did not reach marginal statistical significance ($P<0.10$). We planned a priori to include an interaction term between medical expenditures and child health status to examine whether the effect of child health status on acute malnutrition risk varied with the level of medical investment.

The results of the hazard analysis are expressed in terms of hazard ratios (HR). For categorical predictors, HRs represent the relative risk of becoming acutely malnourished in the category of interest compared with children in the reference category. For continuous predictors, the HR is the relative risk of acute malnutrition associated with a one-unit increase in the predictor. The exact marginal method was used to account for ties due to discrete time units.

We provide baseline descriptive statistics for all independent variables. We also report significance tests comparing mean differences for normally distributed variables (t-tests), equality of medians for non-normally distributed variables (Wilcoxon rank-sum tests), and frequencies for categorical variables (Pearson's Chi-squared tests) at baseline between those children who eventually developed acute malnutrition and those who did

not. Survival curves are provided for select outcomes using the Cox hazard model estimates. Values in the text are HRs with 95% confidence intervals (CIs), means ± standard deviation (SD), or frequency and percentage, as appropriate. Significance was assessed at the $P<0.05$ level.

Exclusions

An analysis of changes in height between surveys suggested that in some households, children other than the target child may have been measured and/or height measurement errors exceeded plausible limits. We identified these individuals as those whose height reduced between two consecutive surveys and/or those whose height increased at a pace greater than 2.5 cm between two consecutive surveys, while making allowances for measurement error (±2cm). This limit to linear growth has been used elsewhere (108). These criteria resulted in the exclusion of data for 33 children. Data for 420 children were retained. There is no evidence that excluded children were more or less likely to develop acute malnutrition than those retained (Pearson $\chi^2=0.0067$, $P=0.94$).

Results

Adherence to the CTP was 100%: all 453 original participating households received six cash transfers. Among households retained for data analysis (n=420), adherence to the survey and anthropometric measurement was 99% (n=414): three households declined participation in the survey in select months, and three were unable to be contacted for all six surveys. Data for these households were included in analysis when available. Data

for two households were right-censored due to death of the target child. Post-hoc power analysis indicate that the study sample size (n=420) provided >80% power to detect each of the effects estimated by our Cox Proportional Hazard model (alpha 0.05, two-sided).

Figure 2.1 depicts a flow diagram of study participants. Seventy-four children (18%) became acutely malnourished (cases) over the course of the study; 58 of these were moderately malnourished (14%) and 16 severely malnourished (4%). Thirty-four of the cases were indicated by WHZ alone, four by MUAC alone, 31 by both MUAC and WHZ, and five by edema.

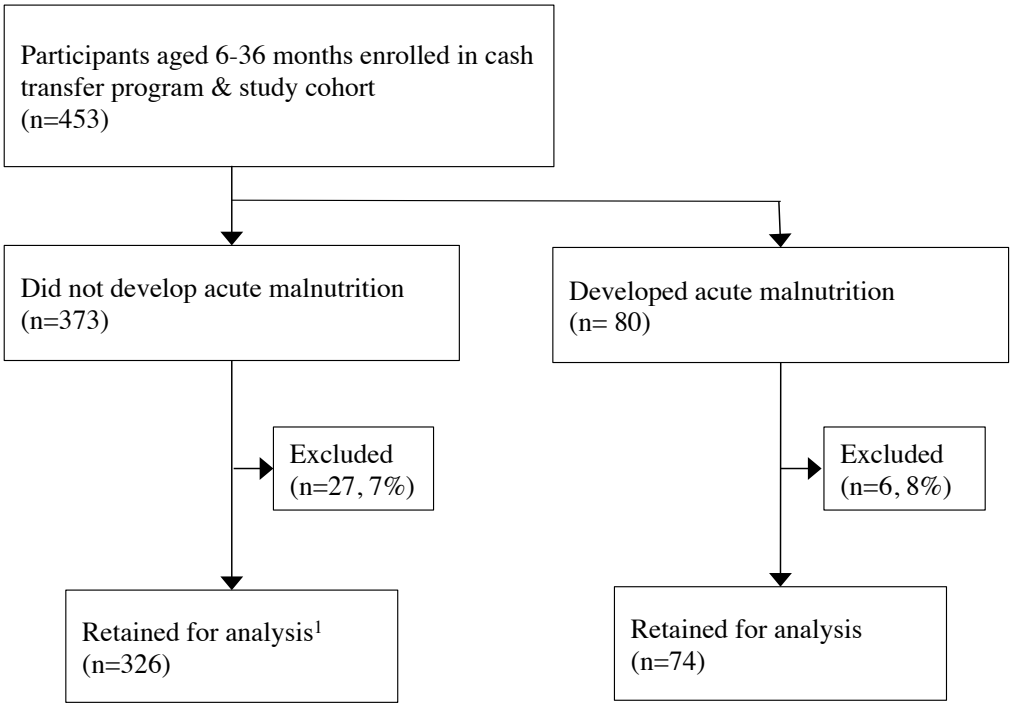

FIGURE 2.1 Flow diagram of beneficiaries and study participants in Save the Children's emergency cash transfer program in Maradi, Niger. Of the households in this study (n=420), approximately 18% (n=74) included a child who developed acute malnutrition. Data for households where a child was acutely malnourished were included in analysis until the point of censorship. Children who exceeded plausible linear growth (>2.5 cm) and measurement error tolerances (± 2cm) between any two consecutive months were excluded from analysis. In households with incomplete data due to refusal (n=3) or loss to follow up (3), data were included in the analysis when available. Data from households in which a target child died (n=2) were included until the month of the child's death.

Moderately and severely malnourished children did not differ significantly by any of the baseline variables measured (results not shown). There were 950 reports of child illness, with between 33% (n=138) and 53% (n=222) of participants reporting an ill child in a given month.

The baseline characteristics of participants are presented by acute malnutrition outcome in **Table 2.1**. The mean baseline age, WHZ, and MUAC of cases were lower by a magnitude of 2 months, 0.45Z and 5mm, respectively ($P<0.05$). Case households reported slightly but significantly less general spending (non-medical, non-food) on the target child ($P<0.05$), and a larger proportion of case households were in the lowest wealth category (23% difference) ($P<0.001$). There were no significant differences between case and non-case households in terms of dietary diversity, meal frequency, recent childhood illness, household size, food insecurity, reported weekly spending on food or medical costs, education level, mothers' health, time to nearest health facility, or the use of protected water sources at baseline.

TABLE 2.1 Baseline characteristics of cohort study participants in Save the Children's emergency cash transfer program in Maradi, Niger, by acute malnutrition outcome [1]

Variable	Acute malnutrition detected	No acute malnutrition detected	Diff.	P-val. [2]
N	74	346		
Child characteristics				
Female	33, 45%	176, 51%	6%	0.33
Age [3], months	20 ± 8	22 ± 8	2	0.02
Height, cm	74.3 ± 6.5	76.7 ± 6.3	2.4	0.00
Weight, kg	8.3 ± 1.3	9.1 ± 1.5	0.8	0.00
WHZ	-1.22 ± 0.54	-0.77 ± 0.73	0.45	0.00
HAZ	-2.70 ± 1.38	-2.43 ± 1.41	0.27	0.14
MUAC, mm	136 ± 8	142 ± 9	5	0.00
Meal frequency [4]	3 ± 1	3 ± 1	0	0.26
Dietary diversity [5]	2 ± 1	2 ± 1	0	0.13
Breastfeeding [6]	40, 54%	118, 34%	20%	0.001
Receiving supp. food [7]	20, 27%	50, 14%	13%	0.01
Ill within last 2 weeks [8]	22, 30%	135, 39%	9%	0.13
Household characteristics				
Household size [9]	7 ± 2	8 ± 3	0.52	0.13
Minutes to health facility [10]	39 ± 27	33 ± 24	6	0.09
Mental health score [11]	8.6 ± 5.1	8.5 ± 4.7	0.15	0.81
Food insecure [12]	68, 92%	293, 855	7%	0.12
Formal education [13]	58, 78%	269, 78%	0%	0.91
Unprotected water source [14]	37, 50%	145, 42%	8%	0.20
Poorest wealth category [15]	40, 54%	107, 31%	23%	0.00
Expenditures on the target child [16]				
Food, CFA/week	125, 75-200	125 (75-200)		0.86
Medical, CFA/week	0, 0-0	0 (0-0)		0.12
Other, CFA/week	0, 0-0	0 (0-50)		0.03

[1] N=420. Values are mean ± SD; n, percentage, or median (IQR) as appropriate. Acute malnutrition was measured as WHZ<-2, MUAC<125cm, or bilateral pitting edema. All children were free of acute malnutrition at baseline. [2] P values are based on T-tests for continuous and normally distributed variables, chi-squared tests for categorical variables, or Wilcoxon Rank-sum tests for non-parametrically distributed variables. [3] Age was determined by asking to see a birth certificate or by asking the mother directly or, if not known, it was estimated using a local events calendar. [4] The number of snacks and meals consumed by the child in the last 24 hours. [5] The total number of WHO food groups consumed by the child within the last 24 hours (grains/tubers, fruits and vegetables rich in vitamin A, legumes/nuts, animal flesh foods, eggs, dairy, and other fruits/vegetables). [6] Whether the child consumed breast milk in the previous day (0, no; 1, yes). [7] Current consumption of supplementary or therapeutic foods by the target child (0, no supplement; 1, receiving supplement). [8] Diarrhea, cough, fever, malaria, or measles as observed by the mother during the previous two weeks (0, healthy; 1, recently ill). [9] Number of family members currently living in the household. [10] Time to the nearest health facility was estimated by mothers.[11] Maternal mental health was assessed using the Self-Reporting Questionnaire. [12] Food insecurity was assessed using a shortened validated version of the Household Food Insecurity Access Scale (0, no indicators of food insecurity; 1, at least one of 3 indicators of food insecurity). [13] Presence of a formally educated individual in the household (0, no; 1, yes). [14] Uncovered water sources included open wells or open source (0, no; 1, yes). [15] Households occupied one of two wealth categories according to local standards using the Household Economy Approach (0, poor; 1, poorest). [16] CFA = West African franc. At the time of the study, 1 USD = 540 CFA.

Children in households ranked as "poorest" at baseline were significantly more likely than children in households ranked as "poor" to become acutely malnourished (HR: 2.98; 95%CI: 1.86, 4.78; P<0.001) (**Table 2.2**) (**Figure 2.2**, Panel A). Those with a higher WHZ at baseline had a lower risk of acute malnutrition compared with children with lower baseline WHZ, with each unit increase of baseline WHZ associated with a 65% reduction in risk (HR: 0.35; 95%CI: 0.23, 0.53; P<0.001) (Table 2.2) (Fig. 2.2, Panel B). Greater distance from health facilities was associated with greater risk (HR: 1.32; 95%CI: 1.05, 1.65, P<0.05).

Children who had at least one of the five elicited symptoms of illness within the previous two weeks were 1.79 times more likely to become acutely malnourished than healthy children (HR: 1.79; 95%CI: 1.10, 2.92; P<0.05) (Table 2.2). Among ill children, medical expenditures were not associated with the risk of acute malnutrition (HR: 1.03; 95%CI: 0.98, 1.08; P=0.25) (Table 2.2). Weekly medical expenditures spent on healthy children were significantly associated with becoming acutely malnourished (HR: 1.40; 95%CI: 1.11, 1.77; P<0.01) (Table 2.2) (Figure 2.2, Panel C).

Consumption of supplementary or therapeutic foods showed a trend towards greater risk (HR: 1.52; 95%CI: 0.93, 2.50; P=0.097), whereas older age showed a trend towards lower risk (HR for age 0.97; 95%CI: 0.94, 1.00; P=0.08). None of the following factors were found to be significantly associated with the risk of acute malnutrition: food or other expenditures, meal frequency, dietary diversity, current breastfeeding, household food security status, household size, maternal mental health, the presence of a formally

educated household member, or the use of protected water sources. An interaction between baseline WHZ and child age was not significant (results not shown).

TABLE 2.2 Hazard ratios of child acute malnutrition among households and children targeted by Save the Children's emergency cash transfer program in Maradi, Niger [1]

Variable	Hazard ratio estimate (95% confidence interval)	P-value
Main effects		
Child characteristics		
Ill within last 2 weeks [2]	1.79 (1.10,2.92)	0.019
Receiving supplementary food [3]	1.52 (0.93,2.50)	0.097
Age [4], months	0.97 (0.94,1.00)	0.079
WHZ	0.35 (0.23,0.53)	0
Household characteristics		
Time to health facility [5,6], minutes	1.32 (1.05,1.65)	0.017
Poorest wealth category [5,7]	2.98 (1.86,4.78)	0
Expenditures on the target child		
Medical expenditures [8], CFA/week	1.40 (1.11,1.77)	0.004
Interaction effects		
Medical expenditures and illness	0.73 (0.58,0.93)	0.01
Marginal effects of medical expenditures		
Ill children	1.03 (0.98,1.08)	0.252
Healthy children	1.40 (1.11,1.77)	0.004

[1] Estimates are based on 2,300 observations of 420 individuals. Acute malnutrition was measured as WHZ<-2, MUAC<125cm, or bilateral pitting edema. All variables are time variant unless indicated otherwise. [2] Diarrhea, cough, fever, malaria, or measles as observed by the mother during the previous two weeks (0, healthy; 1, recently ill). [3] Current consumption of supplementary or therapeutic foods by the target child (0, no supplement; 1, receiving supplement). [4] Age was determined by asking to see a birth certificate or by asking the mother directly or, if not known, it was estimated using a local events calendar. [5] Baseline measurement. [6] Time to the nearest health facility was estimated by mothers. The natural log of minutes was used for modeling. [7] Households occupied one of two wealth categories using local standards using the Household Economy Approach (0, poor; 1, poorest). [8] CFA = West African franc. At the time of the study, 1 USD =540 CFA.

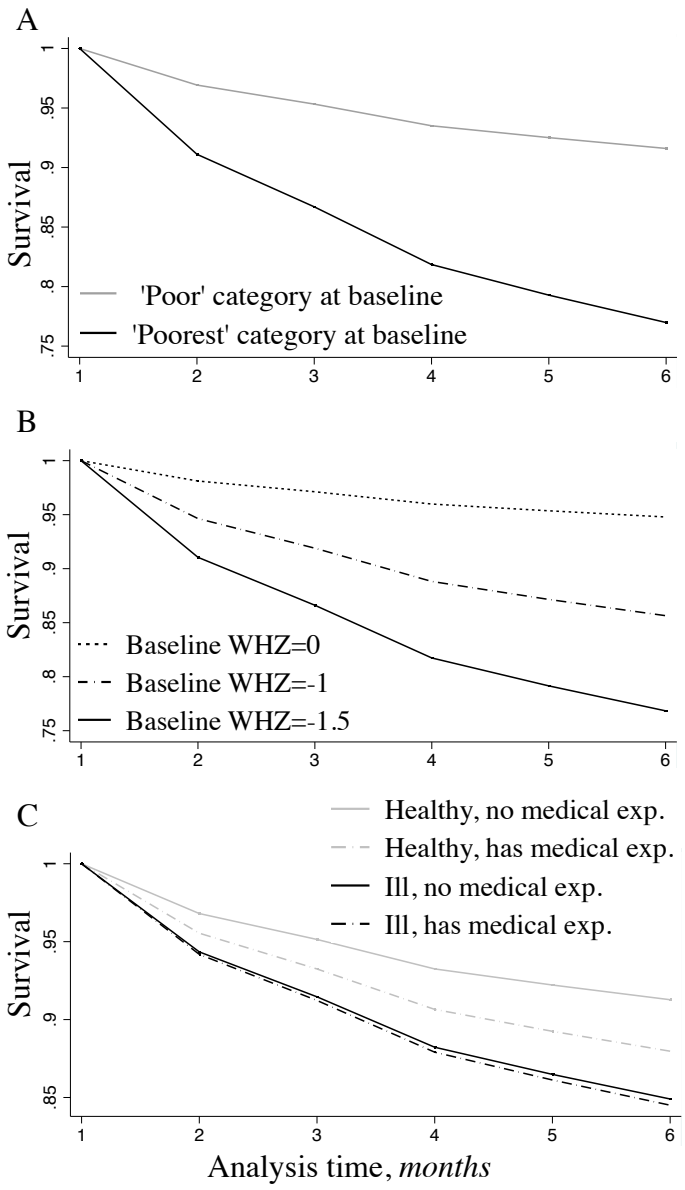

FIGURE 2.2 Acute malnutrition-free survival at specified levels of wealth category, baseline WHZ, health status, and medical expenditures among participants in a study of Save the Children's emergency cash transfer program in Maradi, Niger. The probability of surviving free of acute malnutrition among (A) children in households in one of two different wealth categories, "poor" or "poorest"; (B) children with no wasting (WHZ=0), mild wasting (WHZ=-1) or borderline moderate wasting (WHZ=-1.5) at baseline; and (C) among healthy and ill children, with and without medical expenditures (100 CFA), as estimated by our Cox Proportional Hazards model. Unspecified covariates are evaluated at their mean values.

In the qualitative interviews, most respondents reported returning home following transfer distributions and handing their household's transfer directly to their husband.

Further investigation of the data on medical expenditures revealed that the majority of households spent no money on medical costs: of the 950 reports of child illness, only 300 were accompanied by reports of medical expenditures. An additional 43 reports of child medical expenditures were unaccompanied by reports of recent child illness and are presumed to represent either preventive medical spending or un-elicited cases of child illness.

Discussion

Among vulnerable households targeted by this 6-month emergency CTP, food expenditures for children and other diet-related factors were not found to be associated with the risk of acute malnutrition. Rather, household poverty, baseline wasting, and child illness were significantly associated with high risk.

The relationship between food expenditures, diet, and child nutritional status

Our findings draw attention to a prevailing paradigm regarding the role of emergency CTPs, which equates increased income with increased expenditures on food, and ultimately, improved child nutritional status (32). Similar thinking perpetuates in nutrition research and policy, which tend to focus on the dietary causes of undernutrition and retain a strong 'food first' bias (4,17). This paradigm exists despite extensive

evidence from income-generation and poverty reduction interventions which demonstrates that increased income and/or food expenditures are insufficient to influence child growth, especially when households remain below or near the poverty line (109). Even in food-secure or well-off households, children may not have adequate diets due variation in infant and child feeding practices, household coping strategies in which poor and wealthy households reduce food intake during food shortages, and intra-household food and resource allocation (110).

Expenditures on food, and the extent to which they influence child diet and nutritional status, have been found in several contexts to rely on the interaction of income and gender. A study of Malawian and Kenyan households found that in poor households in which women controlled income, children had higher caloric intake and better nutritional status than in wealthier households where income was controlled by men (40). Similarly, in the Ivory Coast, raising women's share of income was associated with increased allocation of household expenditure to food (111). In the present study, although transfers were distributed to women, qualitative interviews with program beneficiaries revealed that the majority of women gave the transfers to their husbands as soon as they returned home from distribution sites. This implies that women had limited control over the transfer income, and may not have been in a position to direct its spending towards child diet or health.

Turning to the available evidence on CTPs in Sub-Saharan Africa to situate our diet and expenditure-related findings, we see that our results are consistent with work from Niger

and South Africa. In Niger, IFPRI found that cash transfers may be less effective promoters of diet quality where markets are poorly functioning, food prices are unstable, and/or beneficiaries favor bulk grain purchases over diet diversification (57). All of these constraints are likely to occur in our study population, and may have constrained the program's potential to influence child nutritional status through diet-related factors. In a non-emergency South African context, a study comparing private transfers (remittances, or transfers sent home from family members) to public transfers (such as pensions) found that private transfers significantly impacted household expenditure patterns on food and clothing, whereas public transfers did not (112). Seeing as remittances are a critical source of household income in Niger (113), it is possible that a similar dynamic exists between spending of remittances and emergency cash transfers in the Nigerien context as well.

The relationship of medical expenditures, child health, and child nutritional status

The 'food first' bias neglects the causative role of disease and the importance of access to medical care, factors that our analysis showed to be more indicative of acute malnutrition risk than food and diet-related factors. Illness was frequent in our study population and was associated with a high risk of acute malnutrition; this risk did not vary significantly with medical spending. Early informative work from Southwestern Kenya found that even in the presence of a successful food insecurity intervention, in which household income and food expenditures increased, child growth only improved in the presence of substantial improvements in the health environment (41).

Evidence from development literature suggests a positive association between income and medical spending. In a study of 30 African countries, 10% increases in gross per capita income or per capita foreign aid income were each associated with modest (1% and 0.18%, respectively) increases in health expenditures (114). Willingness and ability to pay for healthcare services was highest among rural households in the Central African Republic, despite their lower income relative to urban households (115). Yet one study from Jamaica found that while female decision makers were more likely to allocate a budget to child and family food and goods, they were less likely to spend money on health. Women in the Jamaican context prioritized free sources of health care outside of the mainstream health system (116).

Again turning to CTP-specific evidence, we see that in the recent randomized study of cash and in-kind transfers in Niger there was no difference in medical spending between study arms; no measure of child illness were reported to assess differences in frequency and no conditional terms were tied to health service utilization (57). Yet improving health service access by alleviating financial barriers is a realistic emergency CTP objective with precedence in non-emergency conditional programs, particularly those that promote awareness of how and when to pursue care (42,46). A recent evaluation of a non-emergency, unconditional CTP in Malawi found child illness was less frequent among children in households receiving transfers (117,118). The authors of the Malawi study attributed the difference to increased food consumption and medical spending among transfer households, but did not provide adequate methodological detail assess the quality of these data.

Although basic health services for children under the age of five are supposed to be free in public Nigerien clinics (119), households often have to pay for services and drugs, and frequently purchase drugs from itinerant medicine vendors, (110). Purchasing power is a necessary component of medical spending that an emergency CTP is equipped to address, but financial accessibility alone is not sufficient to guarantee health service utilization or desired child health and nutrition outcomes. Utilization of health services in Niger is sensitive to distance as well as price (120); a recent study identified 1·88 greater odds of complete vaccination by the age of one among children in households <60 minutes from a health facility (121). This is consistent with our finding that those living further from health facilities had a greater risk of acute malnutrition. Many components of health service access—proximity, availability of staff and resources, quality of staff-patient interactions—are similarly beyond the scope of an emergency CTP (61).

The significance of baseline wealth and anthropometric status

The significance of pre-intervention child anthropometric status and household wealth in our results suggest that the CTP in question may have come too late to help the most vulnerable children in the sample. It is reasonable to infer that an emergency CTP alone cannot offset the major physiological vulnerabilities associated with extreme and chronic poverty. Further research about the optimal timing and appropriate value of emergency CTPs would help inform future program design (52). Commitment and investment in nutrition-specific and nutrition-sensitive interventions, including agriculture, public health initiatives including water and sanitation, and social protection schemes with capacity for seasonal surges in resources and programming, may be more effective

approaches for increasing resilience to shocks and promoting sustained prevention of undernutrition and poverty (88,122).

Further insight into the Nigerien context, including social perceptions of child malnutrition and caregiver decision-making around healthcare utilization, is gained from two studies by Hampshire et al, conducted following the food crisis in 2005. Uptake of child health services was very low; children with commonplace illnesses (diarrhea, fever, or respiratory infection) were seldom taken for treatment; among children with more serious or chronic conditions, the condition was often considered an intrinsic quality of the child (110). The authors determine that while the intent of humanitarian interventions is to save lives, the behaviors and decisions made by households and caregivers in emergency-prone contexts is risk-adverse and often detrimental to child health. Constrained decision-making abilities and the need for long-term livelihood preservation resulted in a "failure to invest in growth-faltering children" (82,110). It is certainly reasonable to expect that similar circumstances informed beneficiary decision-making in the context of our study and the 2012 food crisis.

Limitations

This analysis relied on recalled expenditure data, which may have been recalled differentially for food and medical expenses. Given the communal nature of food preparation and consumption in Niger, estimating food expenditures for one child was likely to introduce bias. Medical expenditures may have been easier to recall, as they were discrete events with more obvious ties to one individual. We do not expect that

food or medical expenditure recall errors varied systematically, and we posit that the short recall period (2 weeks) limited the extent of recall errors (123). Expenditure is difficult to measure accurately, and the lack of significant findings in this study should not diminish their importance in promoting positive child health outcomes.

We also see limitations in our definition of child illness. Our survey tool was restricted to five acute conditions and neglected to capture many common or chronic conditions or symptoms (such as vomiting, anemia, helminth infection, micronutrient deficiency, or HIV/AIDS), which would have necessitated medical costs and been associated with higher risk of acute malnutrition but were not elicited by study enumerators. As a result, we suspect that some individuals were misclassified as healthy, leading to conflation of the impact of the influences of medical expenditures and undocumented child illness. In these cases, medical expenditures were tantamount to a second variable capturing un-queried illnesses and their associated risk of acute malnutrition.

Although higher maternal education and knowledge has been associated with improved child nutrition outcomes in previous studies, our data did not contain enough variation to assess this relationship. Finally, although a pre-post analysis of this data reveals that participants showed substantial improvements in anthropometric outcomes, the attributable impact of the CTP cannot be estimated in the absence of a control group (55).

Conclusions

This study provides evidence regarding the use of an unconditional CTP in an emergency setting in Niger. Several health related factors—medical expenditures, child illness, baseline wasting, and poverty—were associated with a high risk of the development of acute malnutrition. Food and diet-related factors—food expenditures, meal frequency, dietary diversity, and household food insecurity—were conversely not associated with the risk of acute malnutrition. These findings highlight the importance of the health-related determinants of child undernutrition, and suggest that a potential role of emergency CTPs may be to enable and promote health service access where services exist. They also indicate a need for more sustained poverty reduction and undernutrition prevention activities in concert with well-timed and strategic use of emergency interventions. Future study involving the use of a comparison group and conditional terms that promote child health and nutrition would be an appropriate way to determine how and whether the incidence of acute malnutrition is reduced in the presence of emergency CTPs.

Chapter 3: The impact of an emergency cash transfer program on child dietary practices and weight gain during a food crisis: Results of a quasi-experimental longitudinal study in Niger

Authors

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Abstract

Assessment of the impact of emergency cash transfer programs on child nutritional status has been difficult to achieve due to the considerable logistic and ethical constraints that characterize humanitarian settings. Here we present the findings from a quasi-experimental longitudinal study of a 4-month conditional emergency cash transfer program implemented by Concern Worldwide during a food crisis in Tahoua, Niger, in 2012, in which the use of a concurrent control group permits estimation of the program's impact on child diet and weight gain. Program beneficiaries received 3 transfers totaling approximately 65% of Niger's gross national per capita income; mothers attended mandatory sessions on child and infant feeding and care practices. Data from 212 vulnerable households and children targeted by the intervention were compared with 212 similarly vulnerable control households and children from the same 21 villages. We used

multilevel mixed effects regression to estimate weight and weight-for-height Z score gain over time. Children in intervention households gained 1.22 kg more weight on average than those in control households over the 2-month duration of study (P<0.001). The weight gain velocity among intervention children (3.79 ± 3.8 g/kg/day) was comparable to results reported by studies of CSB interventions in similar contexts. WHZ gains associated with the intervention were 1.49 Z on average (P<0.001), and the prevalence of acute malnutrition declined from 40% to <5% among intervention children while remaining approximately 20% among controls. We conclude that emergency cash transfer programs have tremendous capacity for promoting child weight gain in the context of a food crisis, and we suggest that the use of strategic conditional terms is likely a key feature for achieving this result.

Background/Introduction

Emergency cash transfer programs (CTPs) are intended to provide immediate relief to crisis-affected households and communities by helping them acquire the goods and services necessary to sustain themselves until the crisis is resolved. They have been implemented in response to social and political conflicts (Sudan), natural disasters (Myanmar), and recurring seasonal effects (Niger), with the common objective of protecting child health and nutrition during periods of disrupted access to food, water, shelter, and/or basic services (32). During such periods, affected households are often unable to derive income, may incur unanticipated or uncovered expenses, and frequently experience food shortages, resulting in increased vulnerability of children to poor diets

and poor health (4). Child acute malnutrition, the deterioration of muscle and fat tissue due to inadequate dietary intake and/or illness, is a potentially life-threatening condition and a focus of humanitarian interventions in crisis-affected communities (4).

Despite the increasing popularity of emergency cash transfer programs as tools during crises, there is surprisingly little evidence available regarding their impact on child nutrition. Due to the unpredictable and urgent nature of the context in which emergency cash transfer programs are most relevant, implementing organizations may sacrifice strategic monitoring and evaluation methods in favor of rapid program execution (7). Similarly, in circumstances where the need for assistance is high, it would be unethical to deny program benefits to eligible populations, which further limits organizational capacity to assess program impact using concurrent controls.

For the logistic and ethical reasons outlined above, most evidence regarding emergency CTP impact is in the form of humanitarian agencies' internal evaluations and yields limited insight into whether the programs resulted in measurable, significant impact or how this impact was achieved. Furthermore, given the strong desire of implementing humanitarian agencies and donors to demonstrate positive program impact, a bias towards reporting positive results in evaluations is highly likely. The available evidence indicates a positive effect of emergency CTPs on child diet quality and nutritional status (wasting) across a range of crisis types in Myanmar, Niger, Somalia, and South Sudan (32). A recent study of an emergency CTP in Niger determined that beneficiaries of the program made gains in child weight-for-height Z scores (WHZ), mid-upper arm

circumference (MUAC), and dietary diversity, as well as improved household indicators of wealth and food security; the study did not have a comparison group so improvements could not be attributed to the intervention (55). Recent work by the International Food Policy Research Institute (IFPRI) offers the first glimpse at rigorous evaluation through the use of a randomized design in Niger and Ecuador (56,57). Cash, food baskets, and food vouchers were randomly distributed to communities in order to evaluate the modalities' potential impact on diet and food security across. In Niger, cash transfer recipient households had less diverse diets and lower food security indicators than those receiving food baskets (57). The IFPRI studies did not include child nutrition or child diet outcomes, and no measures of acute malnutrition were reported.

Further insight into how emergency CTPs may impact child nutrition can be gained from studies of non-emergency CTPs, for which the quality of evidence is generally stronger and conceptual frameworks for program impact are well developed (42,51). Non-emergency programs have shown mixed effects for child nutrition: reductions in stunting, anemia, and underweight have been reported in Mexico and Nicaragua (43,45), yet a recent review of 16 programs in 10 countries found no consistent effect on child nutrition status (50). Findings do show a consistent association with improved uptake of preventive health services (46).

Although the structure and objectives of non-emergency and emergency CTPs are quite different—the former are typically operated over a period of years with a long-term goal of reducing poverty, whereas the latter are operated over a period of months with the

immediate goal of bridging crisis—program impact pathways for each can be conceptualized similarly. For instance, in a conditional CTP, in which beneficiaries must comply with terms set by the program (i.e. attending educational sessions on health, enrolling children in school, keeping vaccination status up to date, etc.), the conditional terms could be hypothesized as a mechanisms to positively impact health, regardless of whether the program was implemented in an emergency context or not. In a non-conditional program, conversely, the cash itself would be the only mechanism generating impact. Figure 1.1, adapted from work by Gaardner (2010) and Leroy (2009) pertaining to non-emergency programs, depicts a conceptual framework for how an emergency CTP may impact child growth (42,51).

The study presented here is the result of a unique opportunity seized by a humanitarian organization, Concern Worldwide (hereafter Concern), during the planning and implementation of an emergency CTP in Tahoua, Niger, during a food crisis in 2012. Concern's targeting scheme yielded natural experiment in which to compare beneficiary households to similar households not receiving the intervention. To our knowledge, this is the only known study of an emergency CTP that included the use of a concurrent control group to estimate the impact on child health and nutrition outcomes. Specifically, the study sought to estimate the impact of an emergency CTP on the diet and weight gain of children aged 6-24 months, and to assess the potential for such programs to prevent acute malnutrition.

Methods

Context of the emergency CTP

The national Government of Niger declared an impending food crisis in May 2012, based on drought and famine early warning system projections of poor crop and fodder production due to insufficient rainfall. High food prices were seen as a key contributing factor to the crisis (79). Similar circumstances in Niger in 2005-2006 and 2008-2009 had proven devastating, with several million people believed to be affected by crop failure, the inability to afford market-sourced foods, and severe food security (80,81). These events led to international calls for enhanced governmental and humanitarian agency response to threats of famine in the country and region (83).

Concern's emergency CTP intervention: Targeting and design

In response to the crisis announced in 2012, Concern implemented a conditional emergency CTP in Niger's Tahoua region. The program targeted 81 villages that had exhibited chronic vulnerability to food insecurity between 2005 and 2011, as determined by federal and Concern assessments of fodder and food production, asset ownership, and previous exposure to drought, pestilence, and human and animal epidemics.

Not all of the households in the 81 villages targeted were enrolled in the emergency CTP. The Household Economy Approach (HEA) was used to assign each household to one of four socio-economic groups, based on household size, land and livestock ownership, and household assets (91). This approach has been used by other humanitarian organizations in Niger previously (92). All of the lowest-ranking households (HEA category "D") were

enrolled in the intervention, totaling 5,286 households. Surplus funding for the intervention allowed enrollment of an additional 1,211 households, which were selected from the second-lowest ranking household (HEA category "C"). These additional beneficiaries were selected by village committees based on vulnerability criteria relative to the average category "C" household, including the number of people able to work, whether the household was male or female-headed, the presence of disability within the family, marital status (monogamous or polygamous), average income, source of income, and type of dwelling. The emergency CTP enrolled a total of 6,497 households.

Each intervention household received a total of 125,000 CFA (approximately 250 USD) split across three distribution periods between July and September 2012. The cash transfers were given to mothers of each household, in order to increase the likelihood that the money would be spent to benefit child health and nutrition (44). The value of the total transfer amount was equivalent to 65% of the gross national income per capita in Niger in 2012 (94).

The condition for receiving each transfer was for household mothers to attend health and education sessions held prior to the cash transfer distributions. Sessions delivered messages about optimal infant and young child feeding (the importance of feeding colostrum after birth and infant and young child feeding for children 6-8, 9-11, and 12-24 months olds), hand washing, and the use and mixing of oral rehydration salts. They also included cooking demonstrations of how to prepare and integrate protein-rich foods and vegetable purees into meals for children.

Additional concurrent programs

In addition to the emergency CTP, two additional programs were being implemented in the Tahoua region. First, services for the community-based management of acute malnutrition (CMAM) were available at all of the 17 major health facilities. This included therapeutic care for severe acute malnutrition and targeted supplementary feeding for moderate acute malnutrition. One month prior to the first cash distribution (June 2012), Concern distributed seeds and fertilisers to the same 81 villages selected for the CTP. Village committees distributed 10 kg bundles of millet seeds and fertiliser to individual households that were considered vulnerable and had access to land.

Design of the emergency CTP evaluation

Concurrent to the emergency CTP intervention, Concern designed and implemented a non-randomized study with two treatment groups to investigate the impact of the program on child nutrition outcomes. Of the 81 beneficiary villages, 21 were purposively selected for the study for their accessibility. In each selected village, an exhaustive sampling approach was taken to enroll all eligible households. Households were eligible for the cash treatment group ("cash group") if they (1) were enrolled in Concern's emergency CTP program, (2) occupied HEA category "C", and (3) had a child aged 6-23 months of age. The child could not be wasted (MUAC<125mm) or have any elicited symptoms of disease (diarrhea, fever, or cough). Households were eligible for the comparison group if they (1) were not enrolled in the emergency CTP, (2) occupied HEA category "C", and (3) had a child aged 6-23 months of age. Comparison group children could not be wasted

(MUAC<125mm) or have any of the symptoms listed above. Children identified during study enrollment were the individuals for whom all data were collected. MUAC was the sole indicator used to assess wasting/acute malnutrition status.

Data collection procedures

Data were collected on child and household characteristics by six teams of two trained Concern enumerators at the homes of study participants at three times: once shortly after the start of the intervention ("Initial") and subsequently in one-month increments ("Midpoint" and "Endline"). Surveys were written in French and administered in the Hausa language. A copy of the survey tool is available in Appendix B (Supplement B2).

Anthropometric measurements were made using standard techniques according to the Standardized Monitoring and Assessment of Relief and Transitions (SMART) guidelines (96). Weight was recorded in kilograms using an electronic scale. Length of children <87 cm long was measured using a baby mat, and height of children ≥ 87 cm tall was measured using a stadiometer. Standard MUAC tapes were used to measure mid-upper arm circumference. Age was either determined by birth certificate or mother's estimation. Any child who was found to be acutely malnourished (MUAC<125 mm) during the study was referred to the nearest CMAM treatment site.

The number of meals and snacks consumed by the target child within the last 24 hours constituted meal frequency. Consumption of any of the 7 World Health Organization (WHO) infant and young child food groups within the last 24 hours was recorded (grains,

legumes, fruits or vegetables rich in vitamin A, eggs, animal flesh foods, dairy, other fruits and vegetables) (100). Children who had breastfed within the last 24 hours were recorded as breastfeeding. Elicited symptoms of child illness included diarrhea, cough, difficulty breathing, or fever in the last two weeks as observed by the mother. Current enrollment in therapeutic or supplementary feeding programs was recorded. Vaccination history (measles and Penta 3) and vitamin A supplementation were determined by reviewing the child's health card. If no card was available, enumerators asked mothers if the child had been vaccinated or supplemented. Mothers provided information about ethnicity, marital status, and the number of cattle, goats, sheep, poultry, camels and hectares of land owned by the household.

Sample size calculation

The sample size for this study was calculated to detect a difference of 0.5 g/kg/day in weight gain velocity between the treatment groups, adjusting for design effect using a factor of 1.5 (chosen using SMART survey guidelines (96)). The target sample size was 213 individuals per group.

Informed consent and ethical approval

Verbal and written informed consent was sought at each survey for each participant. This study was found to be exempt from review by Cornell University's IRB (protocol ID# 1302003601). Concern collected all of the data for this study as part of their routine program monitoring and evaluation activities.

Analytic methods

Data were assembled in Microsoft Excel and analyzed in STATA (104). Anthropometric indicators were calculated using the WHO macro for STATA (105). We used the WHO standards for infant and child feeding practices and growth (95,100). We used Principle Components Analysis (PCA) to extract one component (the first) to summarize household livestock assets from the types and number of livestock owned initially. The first component capture 39% of the variance in livestock ownership data; goats and cattle were the most heavily loaded (Appendix A, Table A3).

Descriptive statistics (means, medians, frequencies) were calculated and plotted for mother, child, and household characteristics as appropriate. A linear regression model was used to predict change in WHZ from initial to endline measures, adjusting for child age, sex, treatment group, baseline WHZ, breastfeeding status, recent illness, Penta vaccination status, enrollment in supplementary feeding programs, and initial household livestock and land ownership.

Multilevel mixed-effects linear regression was used to estimate the effect of the cash transfer program on weight over time, clustering by village and treating individuals as random effects to account for random variation in individual growth. An interaction term between study arm and time permitted us to estimate this effect for each time increment. The model was adjusted for child sex, age, receipt of therapeutic or supplementary foods, and initial household livestock and land ownership.

A multilevel mixed-effects logistic model was used to estimate the odds of developing acute malnutrition (WHZ<-2 or MUAC<125mm), treating individuals as random effects and adjusting for child age, sex breastfeeding status, illness, enrollment in a supplementary feeding program and initial household livestock and land ownership.

Values are reported as mean ± standard deviation, or as frequency (%) as appropriate. The threshold for statistical significance was $P<0.05$.

Criteria for excluding data

We identified outlying anthropometric measurements as WHZ, HAZ, or WAZ scores ± 4 Z beyond the respective median scores for the sample. Outlying Z scores and their component anthropometric measurements (height and/or weight) were excluded from analysis. We defined implausible linear growth as gains exceeding 7 cm or losses exceeding 2 cm over the study period. The positive limit (gain of 7 cm) is the sum of our threshold for allowable measurement error (2 cm) plus the maximum plausible linear growth over a two-month period (5 cm). The negative limit (loss of 2 cm) is again our allowable measurement error. This approach to identifying implausible linear growth has been used elsewhere (108).

Results

Figure 3.1 depicts the intervention and study timeline, and **Figure 3.2** shows participant flow. Of the 212 households recruited for the cash group, observations of WHZ, HAZ, and/or height were excluded for 101 children due to outlying or implausible height measurements, leaving 111 children with complete height, WHZ, and HAZ data. Of the 214 households recruited for the comparison group, observations of WHZ, HAZ, and/or height were excluded for 85 children and two households were excluded due to an error in protocol, leaving 127 children with complete height WHZ, and HAZ data. Weight measurements and all other non-anthropometric data were retained for all children and households (n=424).

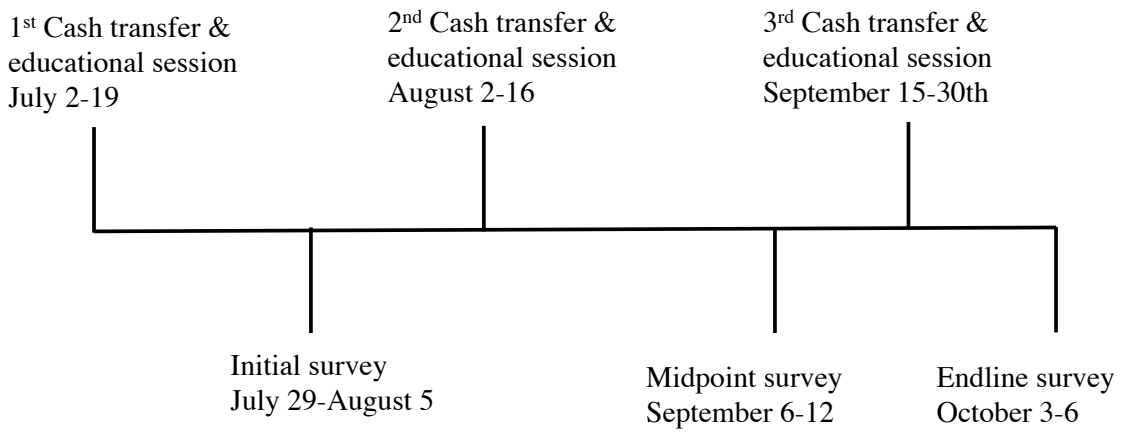

FIGURE 3.1 Intervention and study timeline for Concern Worldwide's emergency cash transfer program in Tahoua, Niger.

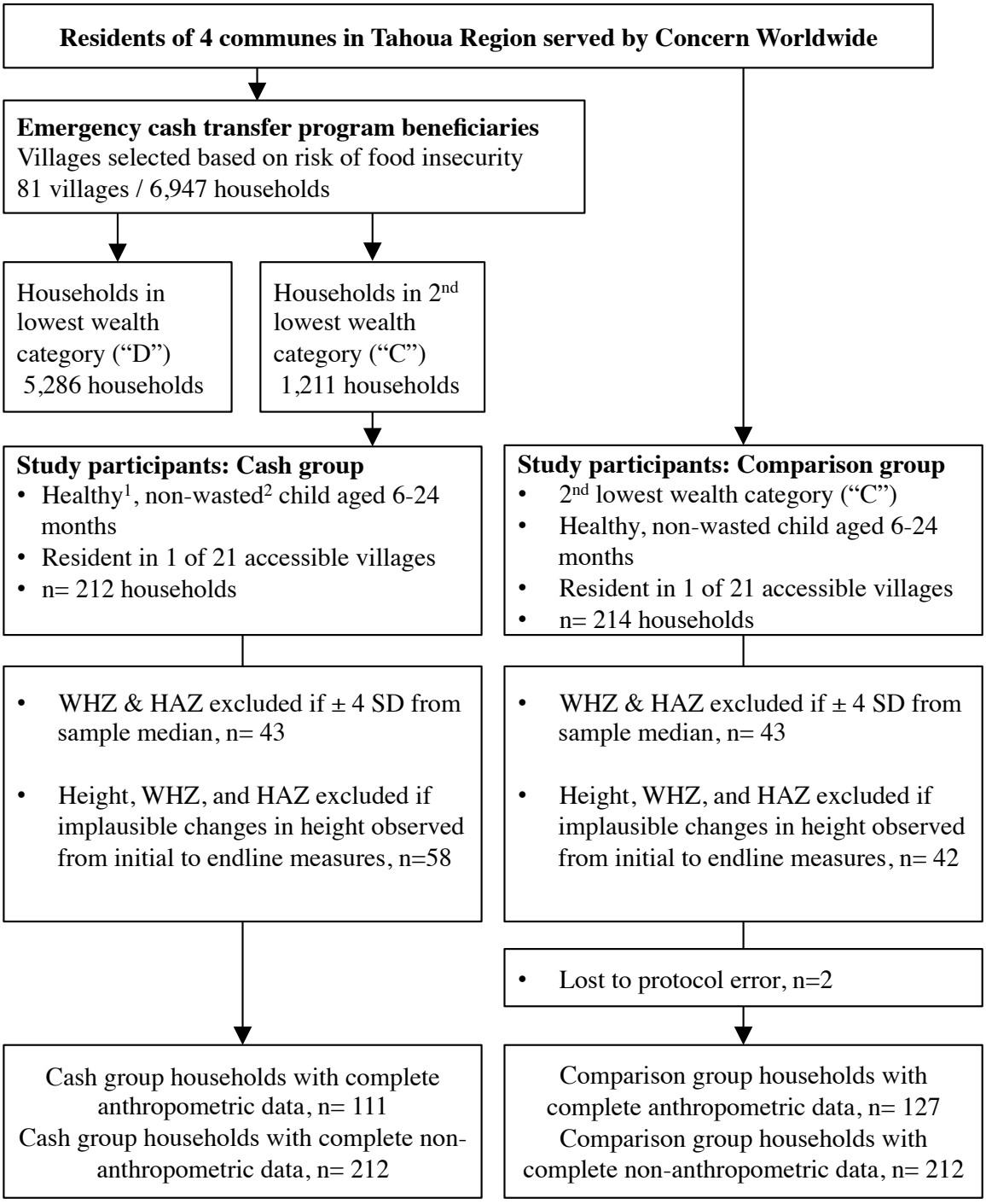

FIGURE 3.2 Flow diagram of program beneficiaries and study participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger. [1] No visible symptoms of diarrhea, fever, or cough. [2] MUAC≥ 125mm.

Program adherence

Program records showed that 98% of the cash group attended all of the educational sessions, and that all cash group households received the full amount of the cash transfers.

Power

Post-hoc power analyses indicated that after excluding data, this study had 82% power to detect the observed mean differences in weight between the cash and comparison groups at the initial time point, and 100% power to detect differences observed at endline (α = 0.05, 2-sided test). For WHZ, initial and endline power were 87% and 100% respectively. The descriptive and analytic results of this study remain consistent with and without the excluded data.

Descriptive results: Initial measurements

The study sample was similar across treatment groups in mean age, age distribution, and sex at the initial measurement (**Table 3.1**). The average age of the children in the sample was 13 months, with most participants falling in the 13-24 month age category. Approximately half of the participants were female.

Despite similarities in age and sex, participants in the cash group were 0.3 kg lighter on average, with mean WHZ scores 0.37 Z lower than their comparison group counterparts ($P<0.001$). Average heights and HAZ scores were similar between the groups.

TABLE 3.1 Initial characteristics of participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, by treatment group[1]

Variable	Comparison group	Cash group	Diff.	P-value [2]
Age [3] (months)	13.4 ± 4.9	13.7 ± 5.2	0.3	0.51
6-8 months	43 (21)	48 (23)		
9-12 months	43 (21)	42 (20)		
13-24 months	126 (60)	122 (58)		
Weight (kg) (n= 211, 211)	8.2 ± 1.2	7.9 ± 1.1	0.3	0.00
Height [4] (cm) (n= 139, 147)	72.4 ± 4.8	73.2 ± 5.4	0.8	0.20
WHZ [4](n= 154, 170)	-1.04 ± 1.08	-1.42 ± 1.12	0.37	0.00
HAZ [4](n= 139, 147)	-1.24 ± 1.36	-1.19 ± 1.49	0.05	0.78
MUAC (mm)	139 ± 9.3	137 ±8.4	2.2	0.01
Sex (female)	99 (47)	109 (51)	4.7%	0.33
Recently ill [5]	92 (43)	99 (47)	3.7%	0.44
Breastfed in last 24 hours	177 (83)	174 (82)	1%	0.76
Number of meals in last 24 hours [6]	4 ± 2	4 ± 2	0	0.40
Diet diversity in last 24 hours [7]	2 ± 1	3 ± 1	0	0.06
Met WHO minimum acceptable diet standard [8]	39 (18)	43 (20)	2%	0.24

[1] Values are mean ± standard deviation or n(%) as appropriate. The total number of observations used to calculate means and frequencies in each group is 212 unless otherwise indicated. In such cases, the number of observations for each group is noted in parentheses following the indicator, with the comparison group sample size preceding the cash group. [2] P-values are reported for t-tests comparing means of continuous variables or Chi-squared tests comparing frequencies of categorical variables. [3] Age was determined by looking at birth certificates when available (n=181) or estimated by mothers. [4] Height data and Z scores using height data (HAZ, WHZ) for children whose linear growth exceeded plausible limits over the 2-month period of study were excluded from analysis. For this reason, the number of observations for anthropometric indicators varies. Criteria for plausibility are described in the methods section of this paper. [5] Mothers reported whether the child had diarrhea, fever, difficulty breathing, cough, or any other illness in the last 2 weeks. [6] Meals included any time the child had been fed, not including breast milk feeding. [7] Diet diversity is the number of food groups consumed according to the World Health Organization guidelines for infant and child feeding, which considers 7 groups (grains, legumes, fruits and vegetables rich in Vitamin A, eggs, animal flesh foods, dairy, and other fruits or vegetables). [8] The World Health Organization minimum acceptable diet standard for infant and young child feeding accounts for age-appropriate breastfeeding, meal frequency, and dietary diversity.

Dietary indicators suggest that participants in both groups had similar diets initially. The prevalence of breastfeeding in the last 24 hours was approximately 80%, and meal frequency averaged 4 meals per day. Dietary diversity was low, and only 20% of participants in either group met age-appropriate WHO minimum acceptable diet standards (Table 3.1).

Illness was common, with at least 40% of children reported as being ill within the previous 2 weeks. The frequency of seeking treatment for ill children within 24 hours of the onset of symptoms was significantly higher in the cash group (n=63, 63%) than in the comparison group (n=42, 46%) ($P< 0.05$). The distribution of illness types (diarrhea, fever, cough, difficulty breathing) did not differ between the treatment groups (Table 3.1).

Descriptive results: Endline measurements

By endline, participants in the cash group gained 1.27 kg more on average than those in the comparison group ($P<0.001$) (**Table 3.2**). This was the equivalent to a 2.48 g/kg/day greater weight gain velocity among intervention children ($P<0.001$) (Table 3.2). Children in the cash group gained more on average than comparison children across all ages observed in the study, with the greatest weight gain observed in older children (12-24 months). Intervention children aged 12-24 months at the start of the study gained 2.06 kg on average, compared to comparison group children of the same age who gained 0.29 kg on average ($P<0.001$) (Table 3.2).

TABLE 3.2 Changes and double differences in anthropometric and dietary characteristics from initial to endline measurements among participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, by treatment group [1]

Variable	Comparison group	Cash group	Double diff.	P-value
Change in weight (kg) (210, 211)	0.49 ± 1.8	1.75 ± 1.8	1.26	0.00
Change in weight among children 12-24 months old initially (kg) (106, 112)	0.29 ± 1.6	2.06 ± 1.7	1.77	0.00
Weight gain velocity [2] (g/kg/day) (210, 211)	1.31 ± 0.8	3.79 ± 3.8	2.48	0.00
Change in WHZ [3] (153, 170)	-0.16 ± 1.3	1.71 ± 1.3	1.87	0.00
Change in MUAC (mm)	-1.70 ± 13.7	5.10 ±13.14	6.80	0.00
Change in meal frequency [4]	-0.03 ± 2.4	1.0 ± 2.7	1.03	0.00
Change in dietary diversity [5]	0.26 ± 1.8	1.0 ± 2.0	0.74	0.00
Number of days between initial and final measurements	62.70 ± 2.2	63.50 ± 2.4	0.80	0.00

[1] Changes are from the initial measurement until the final measurement. Values are mean ± standard deviation. The number of observations is 212 unless otherwise noted, in which case the number of observations for each group is noted in parentheses following the indicator, with the comparison group sample size preceding the cash group. [2] Weight gain velocity was calculated as the total gain (g) per initial body weight (kg) over the duration of the study (days). [3] Height data and Z scores using height data (HAZ, WHZ) for children whose linear growth exceeded plausible limits over the 2-month period of study were excluded from analysis. For this reason, the number of observations for anthropometric indicators varies. Criteria for plausibility are described in the methods section of this paper. [4] Number of meals in the last 24 hours. Meals included any time the child had been fed, not including breast milk feeding. [5] Number of food groups consumed in the last 24 hours. Food groups are those identified by the World Health Organization guidelines for infant and child feeding (7 groups: grains, legumes, fruits and vegetables rich in Vitamin A, eggs, animal flesh foods, dairy, and other fruits or vegetables).

The observed mean change in WHZ in the cash group was a gain of 1.71 Z, whereas children in the comparison group saw an average decline of -0.16 Z. The net difference in WHZ change was 1.86 Z (P<0.001). Changes in MUAC followed suit, with intervention children gaining 6.8 mm more on average than comparison children (P<0.001) (Table 3.2).

Mean meal frequency and dietary diversity increased by modest but significantly higher increments in the cash group relative to the comparison group (P<0.001) (Table 3.2). The percentage of children meeting WHO minimum acceptable diet standards rose from 20% to 48% among intervention children, and declined from 18% to 16% among those in the comparison group.

The rate of illness was higher at endline in both groups, with approximately 60% of children reportedly ill within the previous 2 weeks. Prompt (<24 hour) treatment for ill children was sought more frequently in the cash group (=94, 73%) than in the comparison group (n=81, 59%) (P<0.05).

Model results

Our regression models allowed us to estimate the extent to which the improvements in weight and WHZ observed in the cash group can be attributed to the intervention. The effect of the intervention on weight varied with time, as indicated by our adjusted mixed effects multilevel linear regression model (Wald chi^2 848.25, P<0.001). The intervention

was associated with a 1.46 kg increase in weight during the first month of the study, representing approximately 92% of the intervention-associated weight gained by intervention children. This was 0.96 kg more on average than the weight gain in comparison children over the same time period ($P<0.001$). By endline, the intervention was associated with an overall average gain of 1.58 kg, representing a 1.22 kg increase over the weight change in comparison children ($P<0.001$) (**Figure 3.3**).

Other significant predictors of higher mean weight in the regression model included age, with older children weighing slightly more ($P<0.001$), and sex, with males weighing 0.22kg more than females ($P<0.01$). Illness, breastfeeding, and enrollment in supplementary or therapeutic feeding programs were all associated with lower mean weights ($P<0.05$).

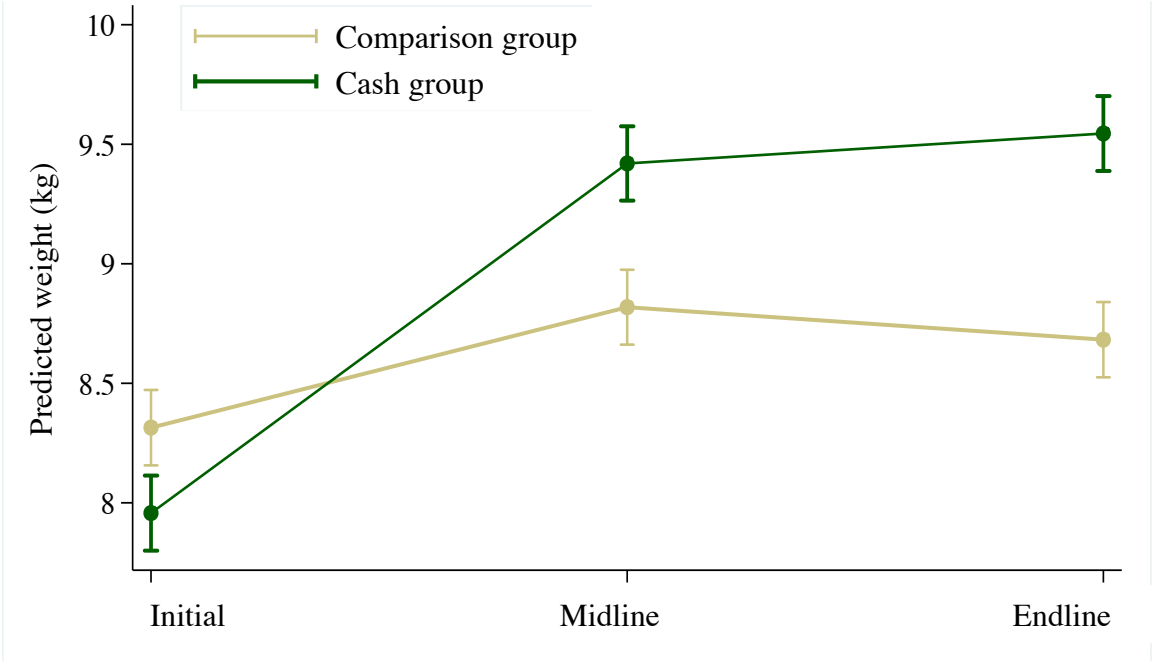

FIGURE 3.3 The predicted weight of participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, across time and by treatment group. Estimates were derived from our multilevel mixed effects linear regression model and adjusted for child age, sex, breastfeeding status, recent illness, Penta vaccination history, receipt of supplementary foods, and initial household livestock and land ownership. Individuals were treated as random effects.

Our linear regression model estimated an overall increase of 1.49 WHZ associated with the intervention, adjusting for multiple covariates ($P<0.001$) (adjusted R^2 0.71, $P<0.001$). Predicted values of WHZ change were highly consistent with those observed in the data (**Figure 3.4**). Other significant predictors of WHZ change were age, with each month of age associated with a 0.02 increase ($P<0.05$); baseline WHZ, with a unit increase associated with a 0.89 lower change in endline WHZ ($P<0.001$), and illness, which was associated with 0.20 lower change in WHZ on average ($P<0.001$).

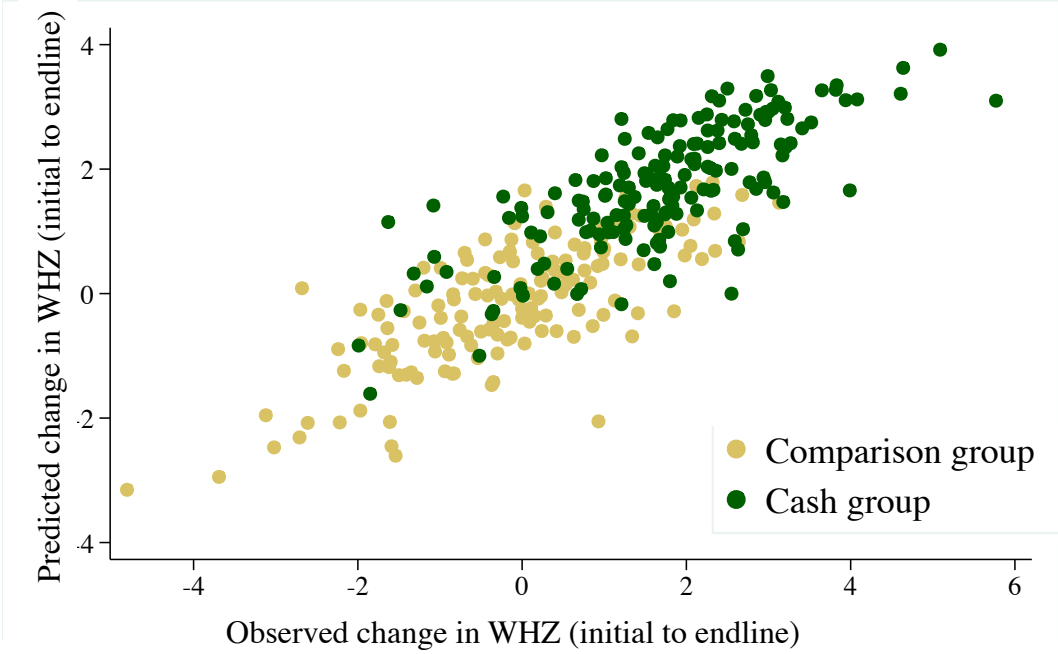

FIGURE 3.4 Predicted vs. observed change in weight-for-height Z scores from initial to endline measurements of participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger. Estimates were derived from our linear regression model and were adjusted for child age, sex, breastfeeding status, recent illness, Penta vaccination history, receipt of supplementary foods, and household livestock and land ownership.

Prevalence of acute malnutrition

Only non-wasted children were eligible for enrollment in this study; wasting was screened for using MUAC. Thus at the initial measurements, all children were non-wasted according to MUAC (MUAC ≥125cm). However, post-hoc analyses of WHZ scores revealed that 19% (n=29) of the comparison group and 31% (n=53) of the cash group would have been considered wasted had the WHZ indicator been used for screening (WHZ≥-2) (**Figure 3.5**). The prevalence of acute malnutrition as indicated by WHZ decreased over time in the cash group to 1% at endline (n=2), whereas initial levels were sustained in the comparison group (n=25, 16%).

If WHZ and MUAC combined are used as a joint indicator of wasting in the evaluation of the intervention, the results indicate that the probability of developing acute malnutrition (MUAC<125 or WHZ<-2) in the cash group declined from nearly 40% at the initial survey to less than 5% by endline (**Figure 3.6**). It remained around 20% in comparison children at all time points.

Discrepancies between MUAC and WHZ are not unusual: MUAC is considered more predictive of mortality risk and less sensitive to changes in weight (124,125). A supplementary analysis of weight gain, weight gain velocity, and changes in WHZ and MUAC among children who were non-wasted according to either indicator of acute malnutrition –WHZ and MUAC—is presented in Appendix A (Table A4).

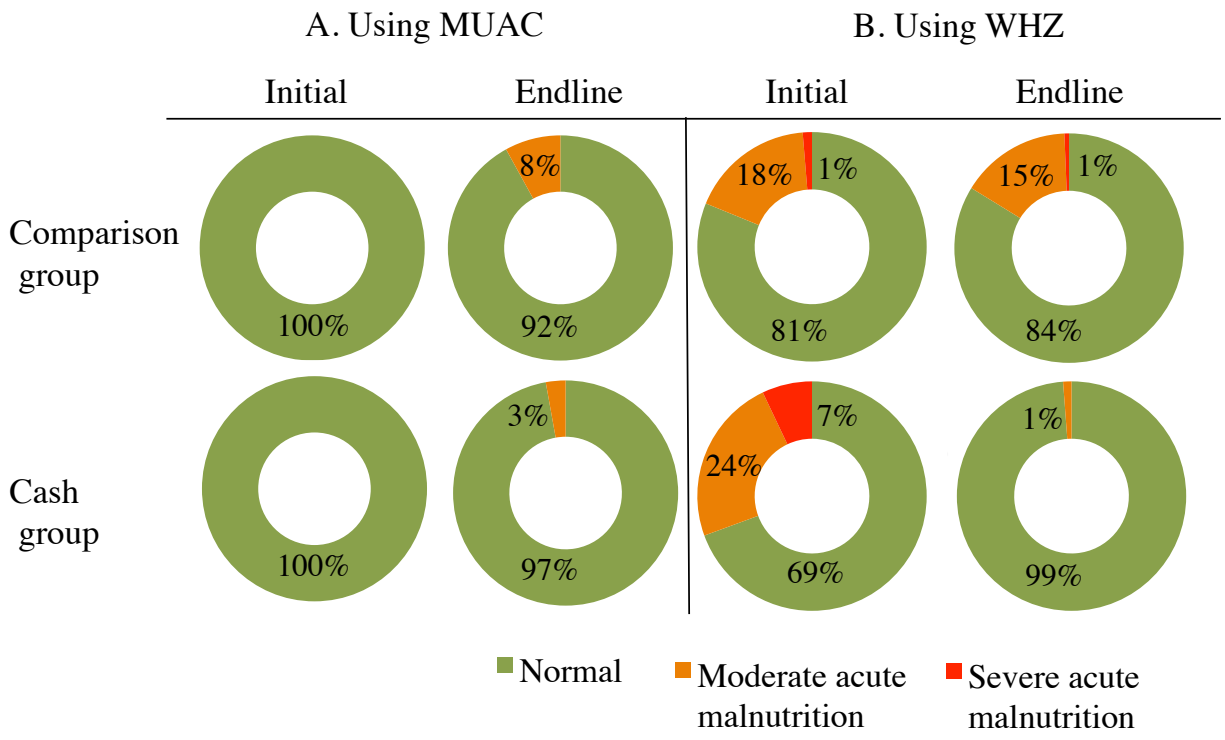

FIGURE 3.5 The prevalence of acute malnutrition among participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, according to mid-upper-arm circumference (MUAC) and weight-for-height-Z scores (WHZ) at initial and endline measurements. Normal: MUAC ≥ 125mm. Moderate acute malnutrition: MUAC<125mm, ≥ 115mm, or WHZ <-2, ≥ -3. Severe acute malnutrition: MUAC<115mm, WHZ<-3, or bilateral pitting edema.

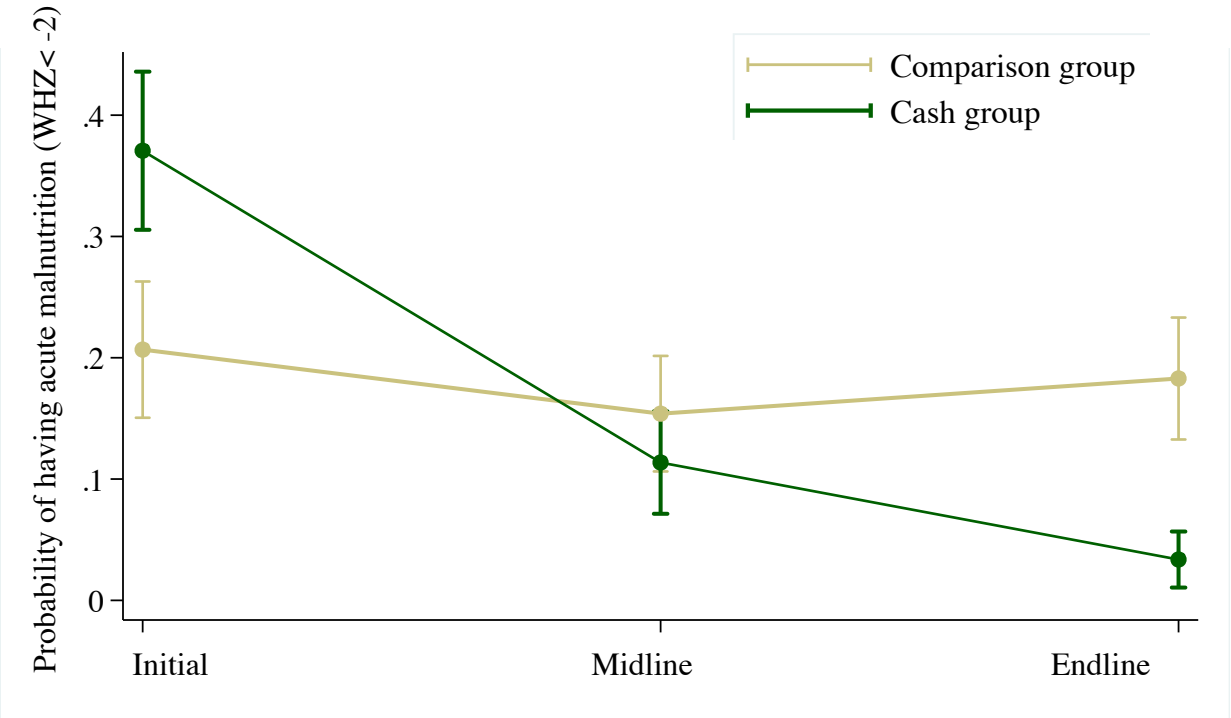

FIGURE 3.6 The probability of acute malnutrition (weight-for-height Z score <-2) among participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, across time and by treatment group. Probabilities were generated using our multilevel mixed effects logistic regression model and were adjusted for child age, sex, breastfeeding status, receipt of supplementary foods, and household livestock and land ownership. Individuals were treated as random effects.

Discussion

This study used a quasi-experimental design to examine the impact of a short-term emergency CTP on child diet and nutrition outcomes in the context of a food crisis in Niger. Our findings show that emergency CTPs have the capacity for rapid impact on child ponderal growth—in the program studied here, dietary indicators improved, weight gain accelerated at a rate high enough for participants to reach median WHO growth standards for WHZ, and the prevalence of acute malnutrition in the cash group radically declined. Although limitations in the design and execution of the study make a precise estimation of the impact impossible, the findings nonetheless make a substantial contribution to our understanding of whether and how emergency cash transfer programs can prevent acute malnutrition.

Biologic plausibility

Studies of conventional food-based interventions for treating acute malnutrition provide a useful reference with which to consider the ponderal growth observed in this study. Weight gain velocities among children with MAM were 3.1 g/kg/day on a fortified corn-soy blend flour in Malawi (24), and as high as 5.67 g/kg/day among children with MAM consuming ready-to-use therapeutic foods in Niger (23) (**Table 3.3**). Among severely malnourished children with complications receiving inpatient care, weight gain <5g/kg/day is considered 'poor', and >10g/kg/day is considered 'good' (126).

TABLE 3.3 Weight gain velocity among participants in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, compared to weight gain velocities among participants in food-based interventions for the treatment of acute malnutrition

	Emergency cash transfer		**CSB [1] or RUF**		**RUF**	**CSB or RUF**		**CSB or FS**		**F-100**
Location	Niger		Niger		Niger	Malawi		Malawi		Worldwide
Authors	Bliss et al		Nackers et al		Defourny et al	Lagrone et al		Matilsky et al		Ashworth
Year	2014		2010		2008	2012		2009		2003
Objective	Prevention of MAM		TX of MAM		TX of MAM	TX of MAM		TX of MAM		TX of SAM
Treatment arms	Cash transfer	Control	CSB	RUF	RUF	CSB	RUF	FS	CSB	N/A
Weight gain velocity [2] (g/kg/day)	3.7 9 ± 3.84	1.31 ± 0.82	4.59 ± 2.59	5.67 ± 3.0	5.3 ± 0.02	3.1 ± 2.4	3.6 ± 2.8	2.6 ± ?	2.0 ± ?	<5 = poor; 5-10 = moderate; >10 = good
Age range (mo.)	6-24	6-24	6-35	6-35	6-59	6-59	6-59	6-60	6-60	6-59
Duration (wk.)	8	8	4-6	4-6	4	2-12	2-12	2	2	2-12
N	212	212	236	215	59,698	888	918	465	447	NA

[1] CSB = Corn-soy blend fortified flour. FS = Fortified spread. F-100 = Therapeutic milk. MAM = Moderate acute malnutrition. RUF = Ready-to-use food. SAM = Severe acute malnutrition. TX = Treatment. [2]

The weight gain velocity observed among CTP beneficiary children in our study (3.79 g/kg/d) falls within the range of weight gain observed for many fortified-blended flour interventions used for the treatment of MAM (Table 3.3). It falls below the target weight gain for the 'average' child aged 13-15 months with moderate acute malnutrition (5g/kg/day, the equivalent of about 770 kcals/day) (5,95). An important note regarding the use of weight gain velocity from food-based interventions as a reference for this study: beneficiaries of the interventions represented in Table 3.3 were being treated for MAM or SAM, whereas the population in the study at hand was a mix of non-malnourished children and those with MAM.

Other studies of CTPs—primarily non-emergency programs—have found that children aged 1-2 years are most responsive in terms of linear growth (52). We observed a similar trend for ponderal growth in our data, with children 12-24 months showing a stronger response to the intervention than children < 12 months.

Potential mechanisms of program impact

The mechanism for the improved dietary intake and changes in weight observed in the cash group could have been mediated by either the income or the conditional education sessions, or by a combination of the two (Figure 1.1). Because the transfers and the education were delivered in tandem, and no group received just one or the other, the relative importance of the cash versus the conditional terms cannot be separated. However, the high adherence to the conditional terms of the program should not be overlooked as a potentially critical key to the apparent success of this program. Nutrition education is not typically included in humanitarian organizations' immediate responses to emergency settings, making the use of educational emergency CTP

conditions novel. Our data do not allow us to test the value of the conditional terms; evidence from non-emergency CTPs and behavior change interventions supports the hypothesis that the sessions could have led to positive changes in child feeding and care practices (51,127).

The value of the cash transfer was high relative to the GNI per capita of beneficiaries. We know from studies of long-term, non-emergency CTPs that the value of transfers is a determinant of whether beneficiaries adhere to conditions, and ultimately, whether the program has an impact. In the well-documented non-emergency CTP in Mexico, Progresa, transfers equaled 20-30% of monthly household income, an amount that was perceived to be high by beneficiaries and one likely reason for the program's success in improving child linear growth and anemia rates (43). Conversely, a program in Honduras distributed transfers equivalent to less than 4% of monthly household income, a factor considered relevant to the program's lack of impact on child growth (51). In both examples, the relative size of the transfer likely influenced how able and how motivated beneficiaries were to make changes to their food purchasing and provisioning behaviors. Additional findings from Progresa showed that transfers influenced women's interest and ability to negotiate better healthcare, empowering them to demand services for themselves and their children (44).

Limitations

We expect that sample selected for the cash group differed systematically from the comparison group in ways other than the intervention itself, but we are unable to probe the extent of the difference with the available data. Households in the cash group were assigned to receive the intervention due to their greater vulnerability to food insecurity relative to the households in the

comparison group at baseline based on a number of indicators. This decision was made by local authorities and based on objective measures of vulnerability as described in the methods section.

Systematic differences between the treatment groups are not apparent in the household and dietary data collected initially, with the important exception that children in the intervention arm did have poorer nutritional status than those in the comparison group. While unmeasured systematic differences between treatment groups are undesirable characteristics of this study, we note that the program did appropriately target more vulnerable households as per their organizational objectives. We posit that given the direction of the difference in mean weight and WHZ in the treatment groups (with the cash group being more wasted initially and attaining median Z scores on average by endline), the gains in nutritional status in the intervention group can be plausibly attributed to the intervention.

An additional limitation of this study is that the first data collection period occurred after the cash transfer intervention had begun. Thus, the actual status of both treatment groups prior to the intervention is unknown, and a precise estimate of the effect of the program on child diet and/or growth is difficult to achieve. Given the first limitation described above, the lagged timing of the initial survey likely produced an underestimate of the effect of the intervention.

As mentioned in the description of the intervention, a seed and fertilizer program was also implemented in the same region and similar time period as the emergency cash transfer program. Concern estimates that more households in the cash group than the comparison group would have been beneficiaries of the agriculture services, but participation was not documented.

Important to note is that given the timing of the seed and fertilizer distribution and the time needed to grow and harvest a millet crop, it is unlikely that the agriculture services contributed to the weight gain in the intervention group. Nonetheless, it is conceivable that this study's findings may be due to one or more of the interventions delivered (cash, education, and agriculture), but it is not possible to assess this given the study's design.

Finally, as this was a non-blinded study, the possibility of bias cannot be excluded. We attempted to limit the extent of recorder bias by using conservative cutoff criteria to identify outlying anthropometric measures as well as implausible changes in linear growth.

Conclusions

Three lines of convergent evidence support the conclusion that Concern's emergency CTP had a positive impact on child growth. First, the observed weight gain in the cash group is within the range observed from food-based interventions done in similar contexts and significantly greater than that seen in the comparison group. Second, the observed improvements child growth are consistent with, and partially explained by, the improvements in meal frequency and dietary diversity. These latter behavior changes, in turn, are consistent with the high value of the transfer (65% of GNI per capita for Niger in 2012) and the high rate of adherence to conditional education sessions on infant and child feeding. Third, the most important design weaknesses (the timing of the baseline survey and the non-randomized design) both are likely to produce conservative estimates of the effect size. Although these design weaknesses limit our ability to make a precise estimate of the impact of the program, they strengthen our conclusion that this prevention-oriented CTP made a meaningful difference in the growth of vulnerable children. We

conclude that emergency cash transfer programs have tremendous capacity for promoting child weight gain in the context of a food crisis, and we suggest that the use of strategic conditional terms is likely a key feature for achieving this result.

Chapter 4: Stigma and its role in limiting access to treatment for child acute malnutrition

Authors

Jessica Bliss, Rebecca Stoltzfus, and David Pelletier

Abstract

Acute malnutrition, "the every day emergency", affects millions of children each year, yet the coverage of life-saving treatment through the Community-based Management of Acute Malnutrition (CMAM) is estimated to be below 15%. The factors most commonly documented as barriers to maternal and child health services—women's time constraints, distance, and lack of awareness about the program or eligibility—are likely to limit CMAM coverage as well. Suspecting undocumented factors may also be at play, we investigated the potential role of stigma as a unique barrier to accessing care for acutely malnourished children. Caregivers of children of normal status (n=289), moderate acute malnutrition (n=259), and severe acute malnutrition (n=163) participated in this facility-based study across eighteen rural health facilities in Marsabit County, Kenya. We used multilevel mixed effects logistic regression to estimate the odds of reporting shame or emotional discomfort as a barrier to accessing healthcare. We found that the most common barriers to accessing child health care were indeed those known to be universally problematic: women's time and labor constraints constituted the top five most frequently reported barriers regardless of child acute malnutrition status.

Emotional discomfort with their purpose for attending the facility was reported by 40% (n=65) of women with severely acutely malnourished children, 28 % (n=71) of women with moderately acutely malnourished children, and 19%(n=54) of women with children of normal status (P<0.001). The odds of reporting shame as a barrier were 3.78 times higher in among women with acutely malnourished children relative to women with sick children of normal nutritional status (CI: 1.55-9.18, P<0.05). Acute malnutrition-associated stigma in this population appeared to be distinct from stigma associated with food insecurity or poverty. We conclude that acute malnutrition-associated stigma is an under-recognized barrier to accessing CMAM that may be constraining program coverage. There is an urgent need to understand the sources of acute malnutrition-associated stigma and adopt effective means of de-stigmatization.

Background/Introduction

Acute malnutrition affects approximately 11% of children under the age of five each year, or approximately 52 million individuals (1). The condition occurs as a result of infection, disease, and/or restricted dietary intake, and is associated with increased risk of morbidity and mortality. Cases of acute malnutrition may be classified as moderate (MAM) or severe (SAM), and are determined by the use of mid-upper arm circumference (MUAC), weight-for-height Z scores (WHZ), or the presence of bilateral pitting edema[5]. Community-based management of acute malnutrition (CMAM), a treatment protocol that began in 2001 and was adopted globally by 2006, is viewed as a highly efficacious approach to treating acute malnutrition (9). However, of

[5] MAM is defined as a weight-for-height Z-score (WHZ) < -2 and ≥-3, or a mid-upper arm circumference (MUAC) <115 and ≥125mm. SAM is the more severe condition, defined by a WHZ <-3, MUAC <115mm, or the presence of bilateral pitting edema.

the total number of children eligible for CMAM each year, less than 15% are estimated to receive treatment (15). The discrepancy in coverage is thought largely to reflect poor access to existing programs rather than the absence of treatment options (3,62).

Prior studies of health service access in resource-poor settings report that a range of geographical, social, infrastructural, financial, and personal factors influence access to treatment for common childhood illnesses (61,87) (Table 1.2). Barriers to the treatment of childhood malaria and diarrhea have been extensively researched in Kenya, and highlight women's financial and time constraints and lack of awareness of treatment options as major obstacles to seeking care (128-132). Studies of barriers to CMAM include one review of SAM treatment programs across six African countries (the Democratic Republic of the Congo, Ethiopia, Malawi, Niger, and North and South Sudan), which identified fear of rejection, not recognizing the child's condition as malnutrition, lack of confidence in the program, relapse, and distance to the site of program as the most common factors (60). A more recent evaluation of SAM treatment access across 21 countries found the primary barriers to be a lack of knowledge of malnutrition, lack of knowledge about CMAM, high opportunity costs, and distance to site—all of which are consistent with pre-existing knowledge about access barriers for other child health services (62).

Field observations by the first author during Peace Corps service in Niger, West Africa, in 2008 and 2009 suggested that the shame of with having an acutely malnourished child discouraged some caregivers from seeking timely treatment, even when caregivers were aware of CMAM services and such services were available. There is dated evidence showing an association between stigma and acute malnutrition in two other contexts: in a study from Pakistan from the

early 1990s, mothers of children with severe wasting reported hiding their children due to shame and fear of judgment associated with the condition, which was thought to be caused by malevolent spirits (76). In Tanzania at around the same time, stigma associated with poverty was nearly inextricable from that linked to child malnutrition, and was perpetuated through structural violence within the healthcare system (77).

Conceptualizing stigma and its consequences for health

Contemporary conceptualizations of stigma consider the dynamic social, economic, and political contexts and processes that produce and intensify discrimination, expanding on Erving Goffman's pivotal early work defining stigma as the "deeply discrediting" association between an attribute and a stereotype (64,66). Discrimination may be individual, in which a person takes overt discriminatory action against another; structural, in which social or institutional norms perpetuate inequalities; and/or self-imposed, in which members of stigmatized groups experience "situationally based fear that one will be judged on the basis of [negative] stereotypes" (67-69). This concept has also been referred to as "stereotype threat"(69), "identity threat" (68), and "stigma consciousness" (70).

Stigma is well documented for many health conditions, with mental illness being the focus of work prior to the 1990s and HIV/AIDS stigma dominating the research through the present day (65,133). In 2006, the NIH Fogarty International Center's Stigma and Global Health Research Program requested further research about the burden of stigma, its causes, and the development of effective interventions to curb it (74). Recent work has documented stigma in connection to tuberculosis, epilepsy, obesity, and obstetric fistula (72,73,134,135). Although the stereotypes

associated with different health conditions vary, many of the consequences of having a stigmatized health condition are foreseeable in regards to decision-making about prevention, care, and treatment. Common consequences for health and care include anxiety, stress, non-disclosure about one's health status, care avoidance, and potential permanent disability or even death (74,75,78) (Figure 1.2).

The relationship between stigma and acute malnutrition has not been systematically investigated since CMAM became a prominent intervention in child nutrition and health services. We proposed to bridge this gap by collecting empirical evidence on the presence of acute malnutrition-associated stigma in the context of a rural health facility-based survey that identified access barriers for multiple childhood conditions in Kenya. We hypothesized that caregivers of children with acute malnutrition experience feelings of shame, embarrassment, or discomfort around accessing CMAM, in addition to the universal challenges known to limit access to child health services. We also hypothesized that stigma is a contributing factor in the poor coverage of CMAM programs.

Methods

Study setting

Marsabit County, Kenya, covers approximately 26,000 square miles and is divided into six administrative divisions. It is a geographically remote and arid region in North Kenya, home to approximately 290,000 people and subject to drought and food insecurity. Nomadic pastoralism is the dominant livelihood, and is practiced by the dominant ethnic groups in the region: the

Borana, the Gabra, the Rendille, and the Burji. The Borana and Gabra share a common language, the Borana language, which is widely spoken across the region. Political and ethnic tension, primarily between the Borana and Gabra groups, dates back for decades, originating in disputes over land and livestock ownership and water use (85). Violent clashes over grazing land and civil disputes in the town of Moyale, on the border of Marsabit County and Ethiopia, were ongoing throughout 2013 and during the time of this study (136,137).

Rates of wasting (>12%) and stunting (>27%) among children under 5 in Marsabit County are among the highest in the country (138).

Selection of study districts

This study was conducted in three districts of Marsabit County. Districts were selected if Concern Worldwide (Kenya office) supported their child health and nutrition programming and if they had active CMAM participants in June of 2013.

Selection of health facilities

Eighteen health facilities were randomly selected for participation in this study as sites for data collection, six from each study district. We randomly selected three from above and below the 50th percentile of CMAM admissions[6] according to June 2013 records for each district. We used this stratification approach to ensure even representation of population densities and to include facilities with a range of potential accessibility issues.

[6] CMAM admission rates are recorded by clinic staff on a weekly basis and uploaded monthly by district health management teams to Kenya's open-access Health Information System (139).

Selection of study participants

Eligible participants were adult women (≥18 years) who accompanied a child aged 6-59 mos. at a study facility between August and September 2013 and gave informed consent to participate in the study. Women accompanying children <6 mos. were not included, as CMAM protocol for children of this age was not established at the time of the study.

From the pool of eligible women, study participants were systematically and purposively selected into one of three study subgroups based on their child's mid-upper arm circumference (MUAC). Women whose children had severe acute malnutrition (SAM, MUAC<115mm) were eligible for the SAM group. Those whose children had moderate acute malnutrition (MAM, MUAC<125mm, ≥115mm) were eligible for the MAM group, and those with children with a normal MUAC (MUAC ≥125mm) were eligible for the Normal group. Group selection was based on MUAC only and did not discriminate between other indicators of child health or nutrition status or the purpose of the clinic visit (women in any of the three groups could have been present for a well child visit, treatment for illness, etc.).

Target sample size

The minimum target sample size for this study was 144 individuals per group, or 432 individuals total. This target was calculated to detect a 20% difference in the frequency of a unique access barrier between any two subgroups with 80% power, alpha 0.05, and 95% confidence. The sample size was adjusted to account for correlation among individuals from a single facility on a single day by using a design effect factor of 0.05. We did not have prior data with which to estimate the design effect; our chosen value of 0.05 value reflects our assumption that

participants at the same facility were only 5% more likely to have correlating values than participants selected at random.

Sampling strategy

We designed our sampling strategy knowing that it might exceed the target sample size. Due to uncertainty around CMAM admissions caseloads during the study time period, we needed to design a strategy that would reach the target sample size but not over-sample the early weeks of the study. We also expected admissions at some facilities to be lower than in others, in which case low-admissions facilities would need a longer period of time to reach their target sample size. To attain sampling breadth across time as well as ensure that the target sample would be reached at each clinic, we chose to operate the study for a pre-specified period of time (five weeks) regardless of whether the overall target sample size had already been reached.

Four women were recruited per group (SAM, MAM, Normal) per facility per day for four "study days" spread across six weeks (August- September 2013). Study days were pre-selected by health facility staff to coincide with CMAM activities. On each of the four study days at each study facility, every second eligible woman was systematically selected for the MAM and the Normal groups, beginning with the first eligible woman for each group and continuing with every other woman until four women in each group had been selected. This approach was used to limit oversampling of participants early in the day and to reduce the burden on enumerators. As a result of the limited number of women eligible for the SAM group, every eligible woman for that group was selected on each study day.

Data collection procedures

Enumerators were community health workers working under the supervision of one designated study nurse at each study clinic. Enumerators and study nurses were selected based on the their prior experience with data collection, a positive work record, their designation as the primary individuals working at the health facilities selected for the study, and written and spoken proficiency in English and Borana. The survey took approximately 40 minutes and was administered at study facilities after participants had completed their clinic visits. A copy of the survey tool is available in Appendix B (Supplement B3).

The survey consisted of 40 closed or open-ended questions, presented in the English or Borana languages, as preferred by the mother. All questions were originally written in English, translated to Borana by a professional translator, and then back translated to English during enumerator training before the survey was finalized. The survey was pilot tested by enumerators among patients and families at the Marsabit County Hospital, allowing for corrections and adjustments to question wording and order prior to finalization.

Child MUAC, weight, and height were obtained from the child's health card, using the measurements recorded by the study nurse during their clinic visit that day. MUAC was assessed using a standard MUAC tape on the left arm. Length of children less than 87cm long was measured using a baby mat. Height of children greater than 87cm was measured using a wooden or plastic stadiometer. Child age was recorded from the child's health card (n=595, 84%) or estimated by the 116 mothers (n=16%) whose child did not have a health card. Mothers reported their own age and marital status (married monogamous, married polygamous, single,

separated, divorced, widowed); their formal education level (none, primary, secondary, higher); ethnicity; the residential status of their household (resident, refugee, visitor); the number of people living in their household and the number under the age of 5 years; and the primary source of income in their household. Food security was assessed using a condensed version of the Household Food Insecurity Access Scale (102) that queried whether any of the following five events occurred within the previous four weeks: inability to eat healthy and nutritious foods, worry about running out of food, not having any food to eat in the household, going to sleep at night hungry due to lack of food, and going a day and night without eating anything due to lack of food. We asked participants about the presence or absence of 17 household items to assess non-agricultural assets (lantern, cart, hoe or axe, clock or watch, radio, television, car battery, electricity, generator, tape player, bicycle, cell phone, tin roof, latrine, running water, and mosquito net), in addition to recording the number and type of livestock owned by the household. Participants reported their primary reason for being at the clinic on that day, whether their child was ill, any symptoms they noticed in their child, and questions about care-seeking behavior including choice of provider and typical time-to-care.

Open-ended questions about access: Participants were asked to freely list any barriers, challenges, or obstacles that they had faced, either in the past or on the day of the study, in accessing health care for a child. They were then asked to pick what they considered the three most important issues. A pre-specified list of responses was available to the enumerators to aid in data collection, but this list was not made available or indicated to participants. The list included pre-coded responses for "shame" and "embarrassment" using the Borana terms *fokifade amale cherfad* in the event that participants used this language to describe their own experience.

Responses were recorded "1" if listed as one of the three most important issues, and "0" otherwise. Responses that were not pre-specified were written separately and coded by JRB later.

Direct questions about stigma: We also sought to ask participants directly about the concept of stigma as a barrier, regardless of whether they had freely listed it as a barrier. Whereas initial versions of the survey used the word "shame", consensus among survey staff was that using the term in direct questions could alienate or insult participants and should be changed to "discomfort". Thus all participants were asked about their level of comfort with their purpose at the clinic that day. This question was worded to elicit emotional discomfort rather than physical discomfort; enumerators were given additional prompts such as "worried" and "unhappy" to assist if the question was not received as intended. The Borana term used for discomfort was *dansa indagau*. To get a sense of social norms and perceptions of acute malnutrition, we also asked whether participants would expect women whose children were wasted to feel uncomfortable coming to the clinic, and reasons why this might be the case. Answers were pre-coded; unique responses were noted by enumerators and coded post-hoc by JRB later.

Ethical approval

The Cornell University Institutional Review Board for Human Participants granted ethical approval for this study (protocol #1306003948). In Kenya, approval was granted by the Nairobi Nutrition Information Working Group and the Marsabit County Ministry of Health.

Analytic methods

Data were assembled and analyzed using STATA 12 (104). Descriptive statistics (means, medians, frequencies) were calculated for the caregiver, child, and household characteristics as appropriate. We used Principle Components Analysis (PCA) and extracted the first component to summarize household asset-based wealth from the 17 non-agricultural asset variables collected. The first component captured 22% of the variability in asset ownership; the following nine variables were the most heavily loaded: clock, radio, television, electricity, tape player, motorcycle, phone, tin roof, and latrine (Appendix A, Table A5). We also used PCA and extracted the first component to summarize food security status from the five food security variables collected (see data collection section, above). The first component for food security captured 57% of the variability in the data; worrying about food availability and the lack of food in the household were the most heavily loaded (Appendix A, Table A6).

We used multilevel mixed-effects logistic regression to estimate the odds of reporting a barrier given the acute malnutrition status of the child, using the responses to our open-ended questions about access barriers. The ten most commonly reported barriers were used as binary outcome variables in ten separate models, each adjusted for the same set of covariates. We chose 12 covariates that we expected to be potentially confounding because of their association with both exposure (acute malnutrition) and outcome (reporting discomfort, shame, or embarrassment), as well as covariates that we expected to be significant predictors of at least one of the 10 outcome barriers. Covariates included study group (dummy coding for MAM and SAM using Normal as the reference), child age (months) and sex (male=0, female=1), maternal age (years), marital

status (single, separated, divorced, or widowed=0, married=1) and education (0=no formal education, 1=any formal education), household distance from the clinic (minutes), food security status, and wealth, district, and facility caseload (low=0, high=1). Health facility was treated as a random effect. The threshold for statistical significance was $P<0.05$.

We also used multilevel mixed-effects logistic regression to identify factors significantly associated with feeling discomfort at the health facility. Here, we began with the same set of 12 covariates described above and used stepwise elimination to remove non-significant covariates, using $P<0.10$ as the threshold for significance.

Results

Descriptive statistics

Descriptive statistics of the study participants (N=711) are presented in **Table 4.1**. Most participants were married Borana residents aged 22-30 with no formal education, living in households with 4-7 individuals, including 1-2 children under the age of 5. **Table 4.2** presents descriptive data on the children of study participants. The sample was 45% female (n=315), with a median age of 21 months and a median MUAC of 124 mm.

TABLE 4.1 Characteristics of participants in a survey of access barriers to rural health clinics in Marsabit County, Kenya (N=711) [1]

Variable	Normal group (n=289)	MAM group (n=259)	SAM group (n=163)
Women's age (years)	27, 23-30	27, 22-32	26, 22-30
Marital status			
Married, monogamous	239 (83)	195 (75)	131 (80)
Married, polygamous	20 (7)	16 (6)	7 (4)
Divorced or separated	19 (7)	27 (11)	23 (11)
Widowed	9 (3)	10 (4)	2 (1)
Women's education			
None	219	199	125
Any primary	38	42	20
Any secondary or above	19	6	8
Ethnicity			
Borana	171 (60)	147 (57)	78 (48)
Garreh	34 (12)	35 (14)	24 (15)
Rendille	24 (8)	26 (10)	28 (17)
Gabra	16 (6)	18 (7)	14 (9)
Other			
Household status (resident)	274 (95)	238 (92)	144 (88)
Household size	5, 4-7	6, 4-7	6, 4-7
Number of children under 5	2, 1-2	2, 1-2	2, 1-2

[1] Values are n (%) or median, interquartile range as appropriate. MAM = Moderate acute malnutrition. SAM = Severe acute malnutrition.

TABLE 4.2 Characteristics of children of participants in a survey of access barriers to rural health facilities in Marsabit County, Kenya (N=711) [1]

	Normal group (n=289)	**MAM group (n=259)**	**SAM group (n=163)**
Child age (months)	25, 14-36	20, 12-29.5	15, 11-24
Child MUAC (mm)	136, 130-142	123, 121-124	113, 111-114
Child sex (female)	123 (44)	116 (45)	75 (47)
Primary reasons why child was brought to the health facility:			
Treatment for illness	130 (45)	63 (35)	25 (15)
Supplementary feeding	7 (2)	113 (44)	5 (3)
Therapeutic feeding	2 (1)	17 (6)	85 (52)
Referral from health worker	56 (19)	26 (10)	19 (12)
Growth monitoring	55 (19)	24 (10)	20 (12)
Other	38 (13)	12 (5)	9 (6)
Child seem unwell to mother?	173 (60)	127 (49)	84 (51)
If child seemed unwell, symptoms observed by mother (multiple answers allowed):			
Fever	106 (61)	82 (65)	50 (60)
Acute respiratory illness	102 (35)	87 (34)	42 (23)
Diarrhea or vomiting	73 (25)	61 (24)	53 (32)
Lack of appetite	48 (17)	42 (16)	34 (21)
Crying	23 (13)	30 (24)	26 (31)
Injury	22 (13)	12 (10)	1 (1)
Thin	15 (9)	25 (20)	31 (37)
Other	9 (3)	9 (3)	5 (3)

[1] Values are n (%) or median, interquartile range as appropriate. MAM = Moderate acute malnutrition. SAM = Severe acute malnutrition.

Of the 711 total participants, 289 (n=41%) had a child without acute malnutrition and comprised the Normal group, 259 (n=36%) had a child with moderate acute malnutrition and comprised the MAM group, and 163 (n=23%) had a child with severe acute malnutrition and comprised the SAM group. Participants were evenly distributed across the 18 study health facilities.

When asked to free-list barriers experienced personally, participants listed 29 different barriers to accessing child health and nutrition services; the frequency of each barrier is depicted in **Figure 4.1.** Figure 4.1 also categorizes each barrier into one of five types. Temporal and geographic barriers were heavily cited: they comprised four of the top five most frequently reported responses to the question about personal barriers, and accounted for 47% (n=876) of all responses. Social and cultural barriers, although reported less as frequently than temporal barriers, were the second most common type of response, accounting for 24% (n=456) of all responses. Barriers related to personal experience, knowledge, or beliefs were reported 271 times, accounting for 14% of the total, while infrastructural and financial barriers constituted the remainder.

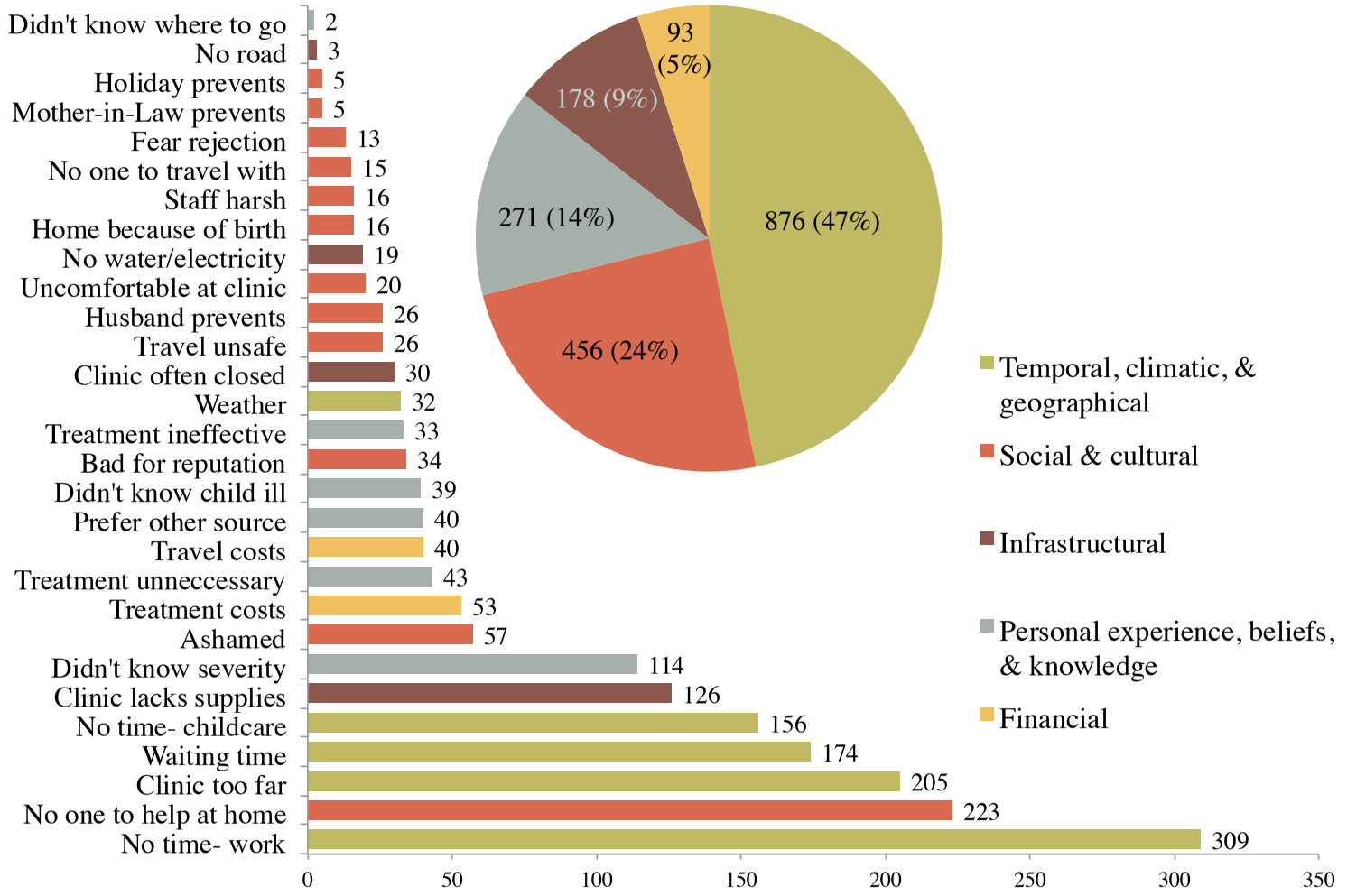

FIGURE 4.1 Barriers to accessing health services for children among participants in a survey of access barriers in Marsabit County, Kenya. The 29 unique responses are named on the Y-axis; the number of times that each response was given is shown to the right of the bars. Responses were categorized according to an

Freely-listed responses mentioning shyness, embarrassment, or shame (*fokifade amale cherfad*) were reported as barriers 57 times, frequently enough to be the 9th most common barrier cited overall but still only comprising 3% of all responses. When we stratified barrier results by study group, the frequency of shame was highest within the SAM group (n=22, 14%), followed by the MAM group (n= 25, 10%). It was not one of the top ten most frequently reported barriers within the Normal group (n=10, 3%). The frequency of the ten most commonly listed barriers in each study group is depicted in **Figure 4.2**.

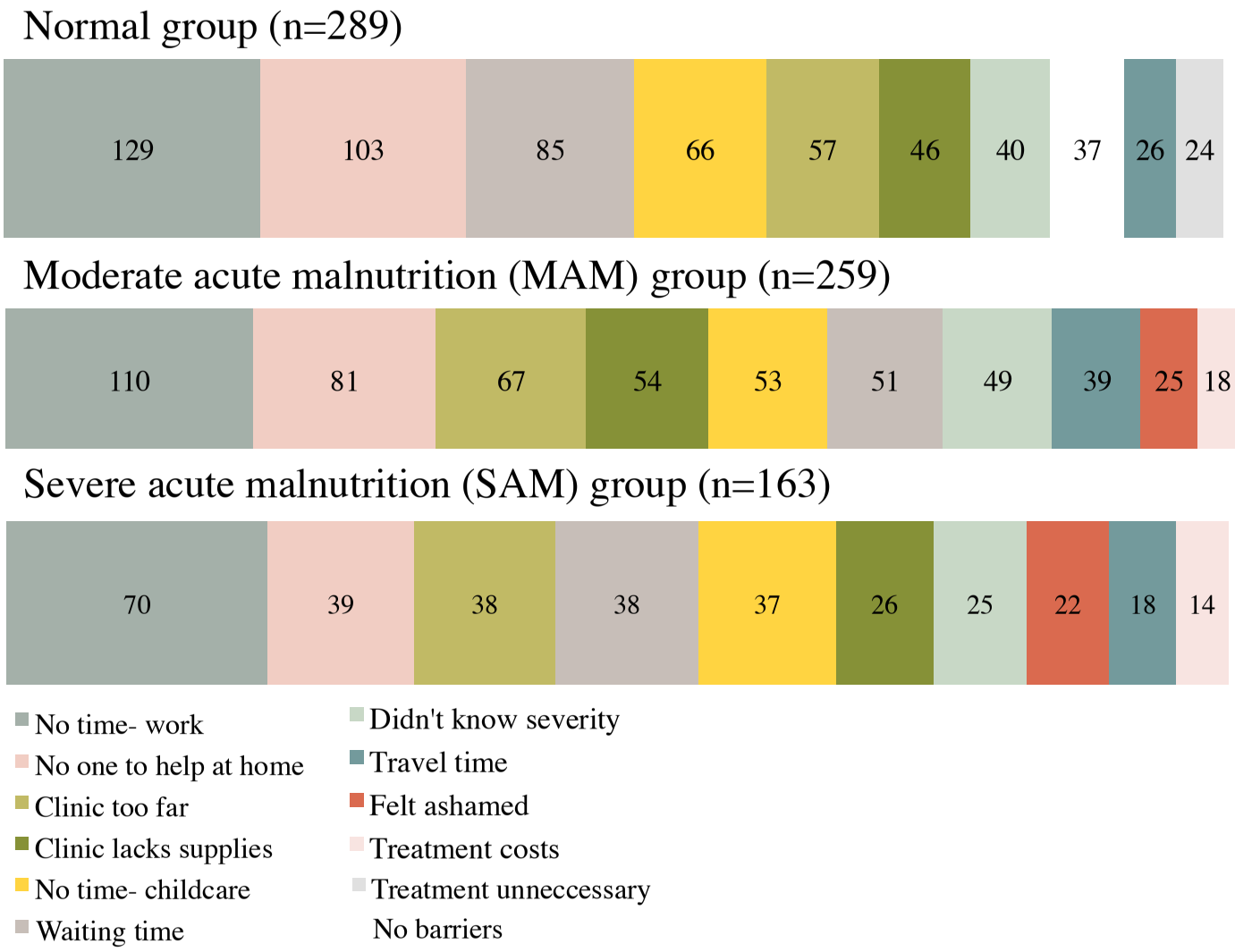

FIGURE 4.2 The frequency of the ten most commonly reported barriers to accessing child health services among participants with children of normal nutritional status, with moderate acute malnutrition, and with severe acute malnutrition.

When asked directly, forty-percent (n=65) of women in the SAM group responded that they were uncomfortable with their purpose attending the clinic on that day; the frequency of this response was lower in the MAM group (n=71, 28%) and lowest in the Normal group (n=54, 19%) (P<0.001) (**Table 4.3**). Three quarters of the total sample (n=526) reported that they would expect women with acutely malnourished children to experience more discomfort attending a clinic with their child when compared to other women. This expectation was distributed evenly across the study subgroups (P=0.55) (Table 4.3).

TABLE 4.3 The frequency of discomfort regarding the reason for their clinic visit, as reported by participants in a survey of access barriers to health services in rural facilities in Marsabit County, Kenya [1]

	Normal Group	MAM Group	SAM Group	P value
Felt uncomfortable about their purpose at the clinic today (n=190, 27%)	54 (19)	71 (28)	65 (40)	0.000
Thought women whose children have acute malnutrition would be more uncomfortable coming to the clinic than other women (n=526, 74%)	208 (73)	195 (77)	123 (76)	0.545

[1] Values are n (%). Significance refers to chi-squared tests comparing the distribution of positive responses across study groups. MAM = Moderate acute malnutrition. SAM = Severe acute malnutrition.

Participants offered a number of reasons why discomfort or shame might occur (or be expected to occur) among women attending a clinic with acutely malnourished children. Having a child with moderate or severe acute malnutrition was perceived to indicate negative characteristics about the child's mother and household. Approximately 60% of respondents mentioned that having an acutely malnourished child would invite the perception that the mother did not take proper care of her child, either in terms of food or other basic provisions (**Table 4.4**). Indicators of food insecurity occurred at consistently higher rates among participants in the SAM group (Appendix A, Table A6).

TABLE 4.4 Perceptions about acute malnutrition reported by participants in a survey of access barriers to child health services in Marsabit County, Kenya [1]

Do women whose children have acute malnutrition feel less comfortable coming to a clinic than other women? (n=711)	
Yes	526 (75)
Why do they feel more uncomfortable? (n=536)	
Perceived that the mother doesn't take proper care of her child	328 (63)
Household perceived to not have enough food	317 (61)
Perceived that mother cannot provide basic things for her child	297 (57)
The mother is embarrassed or ashamed	182 (35)
Perceived that the child has a very severe condition	162 (31)
Perceived that the household is poor	120 (23)

[1] Values are n (%). MAM = Moderate acute malnutrition. SAM = Severe acute malnutrition.

Multivariate regression results

Shame as a barrier, freely listed

Our first mixed effects regression model estimated the odds of reporting shame given the acute malnutrition status of the child in the SAM and MAM groups (consolidated), adjusting for child age and sex, maternal age, marital status, and education, household size, distance from the clinic, food security status, wealth, district, and clinic caseload. Of the top ten most frequently reported barriers in this study, shame was the only barrier that women with acutely malnourished children were significantly more likely to report. Women in either the SAM or the MAM group had a 3.78 times higher odds of reporting shame relative to the Normal group (CI: 1.55-9.18, $P<0.05$) (**Figure 4.3**).

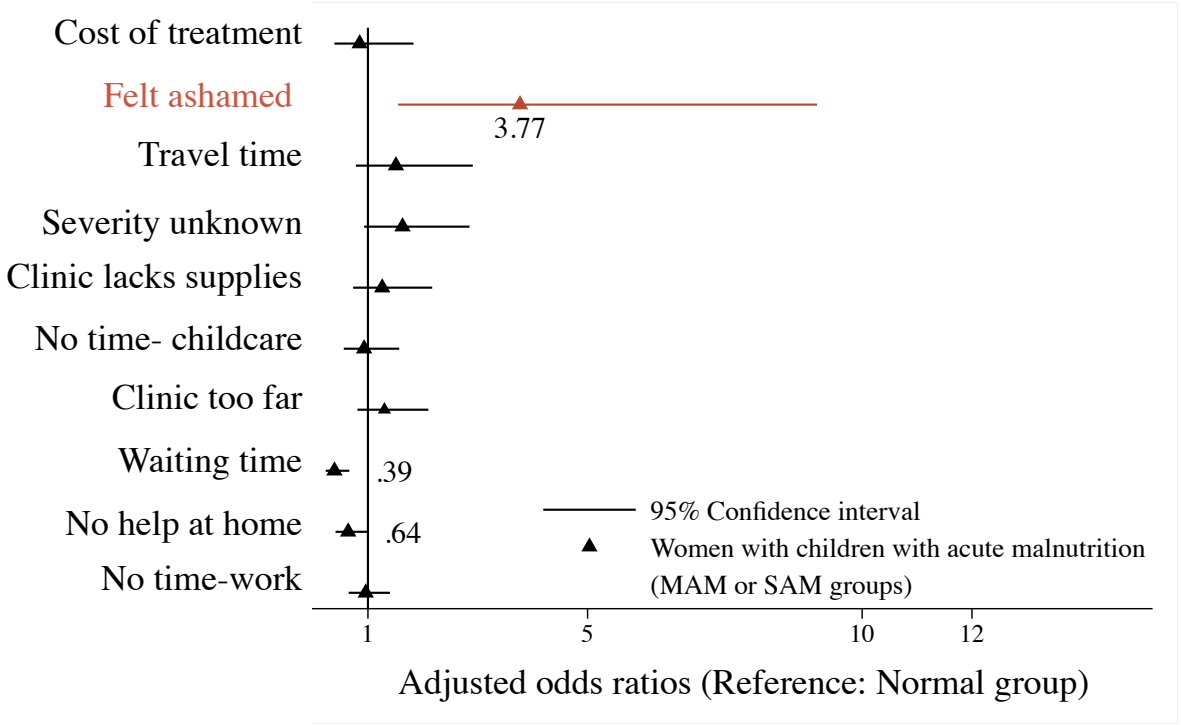

FIGURE 4.3 The odds of reporting one of the10 most common barriers in a survey of access to health services at rural health facilities in Marsabit County, Kenya, (moderate and severe groups consolidated and compared to the normal group). Odds ratios of significant findings (P<0.05) are noted on the figure, and were estimated using a multilevel mixed effects logistic regression model that adjusted for child age and sex, maternal age, marital status and education, household size, distance from the clinic, food security status, and wealth, district, and facility caseload. Health facility was treated as a random effect.

When we separated the subgroups and calculated the adjusted estimates of reporting shame in each group as a barrier relative to the Normal group, we saw that the pattern held. The odds of reporting shame as a barrier were highest in the SAM group (OR: 7.88, CI: 2.62-23.73, P<0.001), followed by the MAM group (OR: 2.84, CI: 1.10-7.47 P<0.05) (**Figure 4.4**).

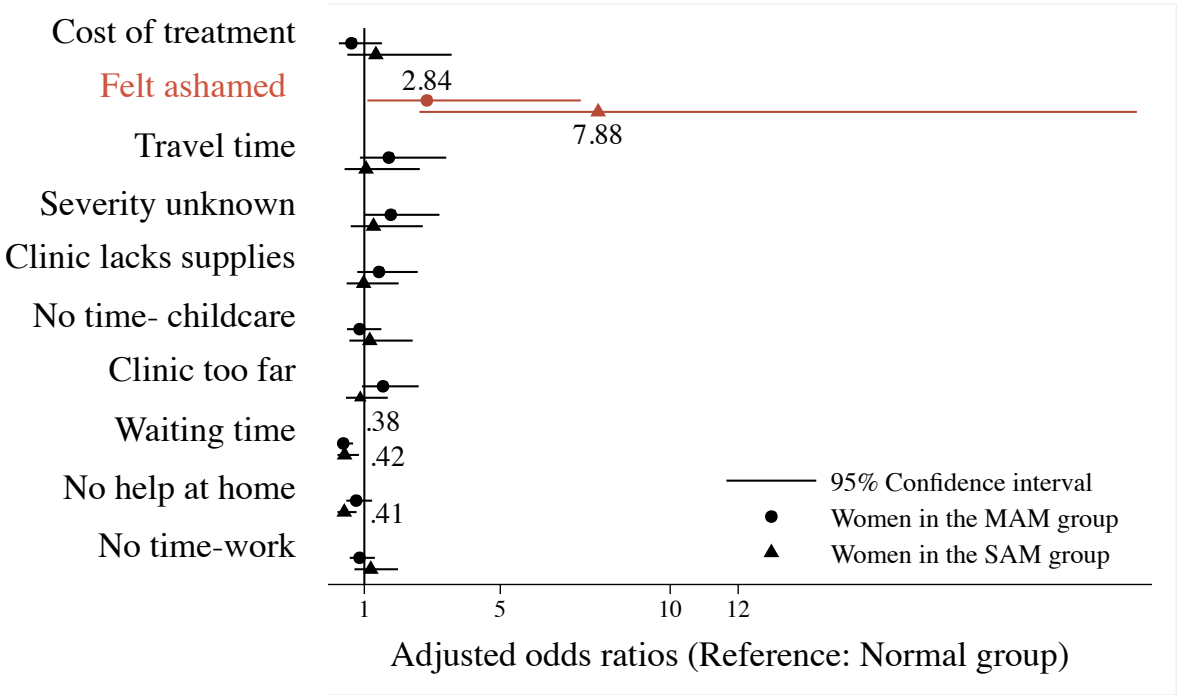

FIGURE 4.4 The odds of reporting one of the10 most common barriers in a survey of access to health services at rural health facilities in Marsabit County, Kenya, (moderate and severe groups stratified and compared to the normal group). Odds ratios of significant findings (P<0.05) are noted on the figure. Estimates were produced by our multilevel mixed effects logistic regression model, which adjusted for child age and sex, maternal age, marital status and education, household size, distance from the clinic, food security status, and wealth, district, and facility caseload. Health facility was treated as a random effect.

Discomfort as a barrier, elicited in direct questioning

The acute malnutrition status of the child and household food security status were each significantly associated with the odds of feeling discomfort at the health clinic on the day of the study. Women in the SAM or MAM groups had 2.30 times greater odds of responding that they felt uncomfortable compared to women in the Normal group (CI: 1.47-3.6, P<0.001). Margins of food insecurity were associated with a linear 1.16 times increase in the odds of discomfort (CI: 1.002-1.35, P<0.05) with each increasing value of the 5-point scale. The probability of discomfort across values of food security is depicted in **Figure 4.5**. Child sex was marginally associated with discomfort, as women with female children were less likely to report discomfort (OR: 0.68, CI: 0.45-1.03, P<0.10).

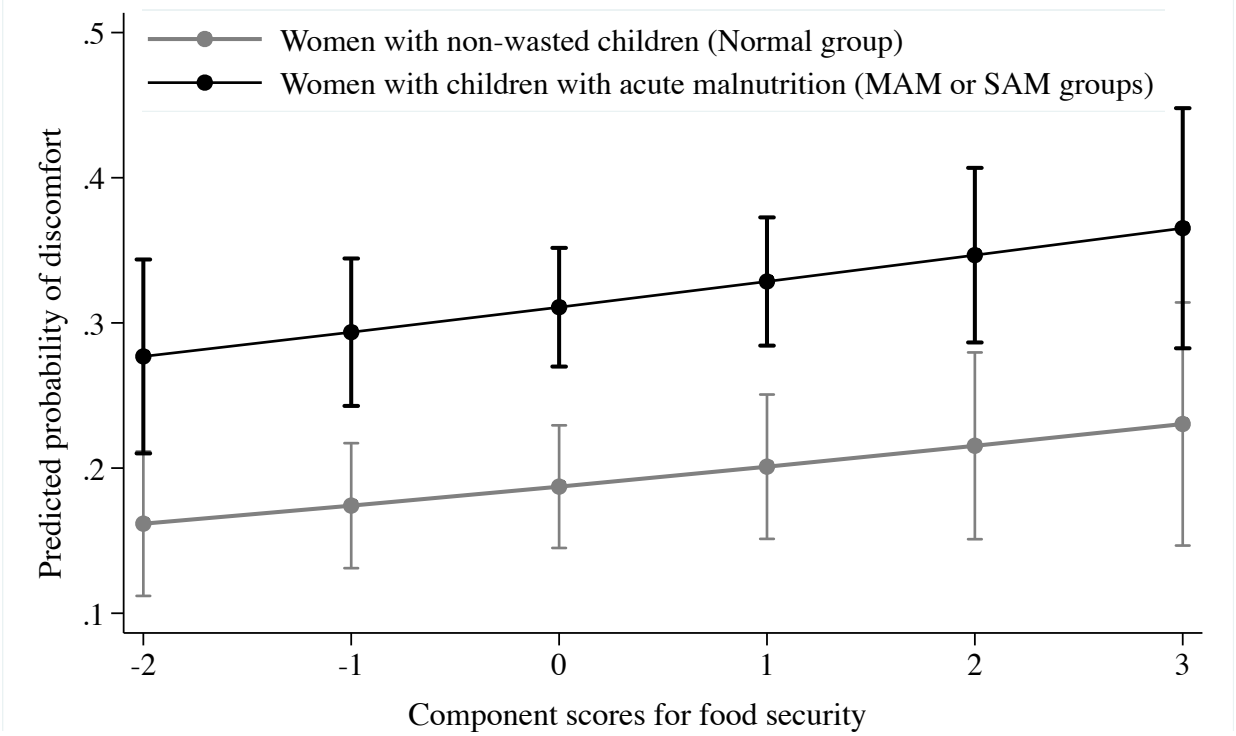

FIGURE 4.5 The predicted probability of reporting emotional discomfort at the clinic across levels of food security among participants in a survey of access to rural health services in Marsabit County, Kenya. Negative values represent food security and positive values represent increasing levels of food insecurity. Probabilities are adjusted for child sex and household food security status. Health facility was treated as a random effect. MAM = Moderate acute malnutrition. SAM = Severe acute malnutrition.

Discussion

This study systematically investigated whether stigma associated with acute malnutrition constrains access to CMAM. By asking participants with and without acutely malnourished children about their experiences in accessing care, we were able to identify those barriers that are universal across child health conditions and those that are unique to a single condition or service. Our findings support the two hypotheses posed earlier, that acute malnutrition is a stigmatized condition and that stigma is one factor limiting utilization of CMAM.

We used three approaches to triangulate the association between stigma and acute malnutrition: we asked open-ended questions about participants' past and current experience accessing a clinic, direct questions about their own comfort level on the day of the survey, and direct questions about general expectations and perceptions surrounding the condition. Each approach yielded consistent findings: most access barriers were universal, regardless of the child's nutritional status or reason for being at the clinic.

Shame was the only barrier uniquely reported by women whose children had acute malnutrition, and the majority of participants perceived acute malnutrition as a condition that would elicit emotional discomfort when seeking care. Our findings support the hypothesis that caregivers of children with acute malnutrition experience stigmatization, as revealed in the feelings of shame, embarrassment, and discomfort reported in the process of accessing treatment.

Sources of stigma among stigmatized health conditions

The existing literature on health-related stigma yields insight into sources of negative stereotyping that may be relevant to understanding the stigmatization of acute malnutrition.

Shame associated with child malnutrition in Tanzania was inseparable from that of hunger and food insecurity; this was largely a result of structural discrimination perpetuated by decades of political and economic policies that prevented households from escaping poverty (77). Similarly, poverty and its constraints were believed to fuel HIV/AIDS stigma in Zambia (141). Recent qualitative work from Zimbabwe showed something different: HIV/AIDS-related stigma was distinct from poverty-related stigma among both HIV-affected and HIV-unaffected children (142). In Pakistan, the belief that child wasting was caused by spirits punishing the mother's immoral behavior was found as the predominant source of stigma (76). Punitive witchcraft has been documented as a perceived cause of poor health, namely epilepsy, and its consequential stigmatization in Kenya and across Sub-Saharan Africa (73,143).

Wasting is a highly visible trait that was tightly associated with HIV/AIDS during the early years of the HIV/AIDS epidemic prior to the availability of antiretroviral therapies, and continues to prompt the labeling of individuals as infected with the virus (144). A recent study of HIV/AIDS related stigma in Swaziland, Namibia, Kenya, Nigeria, Burkina Faso and Senegal found Kenyan narratives about HIV/AIDS to be among the most polarized and moralistic (145). This is consistent with recent findings from Kenya showing that HIV/AIDS related stigma contributes to women's refusal of HIV testing (71).

The above examples are useful for generating hypotheses about the sources of stigma associated with acute malnutrition that we found in our study. One hypothesis is that acute malnutrition-associated stigma is driven by the stigma of poverty and food insecurity, as shown in Tanzania and Zambia (77,141). Yet in our data, household food insecurity and acute malnutrition were independent and significant predictors of discomfort in the clinic setting, intimating that stigma associated with acute malnutrition may be distinct from that associated with food insecurity; this finding seems consistent with the recent finding in Zimbabwe that HIV/AIDS stigma is distinct from poverty stigma (142). A second hypothesis is that "stigma by association", or stigma associated with HIV/AIDS infection, occurs among caregivers of visibly wasted children; this phenomenon has been documented for tuberculosis (72). A third hypothesis, as seen among mothers of wasted children in Pakistan and in communities that stigmatize epilepsy, is the presence of a belief system that views the condition as a form supernatural or spiritual punishment (73,76).

De-stigmatization efforts

Most stigma reduction interventions are primarily informed by socio-cognitive conceptualizations of stigma, and are thus limited to advocacy-based strategies to increase empathy and tolerance among the general public (e.g. via media or political campaigns, health worker training) or to reduce fear among high-risk groups (i.e. via support groups) (65,66,146). Although contemporary conceptualizations of stigma recognize the broader structural and cultural processes that perpetuate stigma, such dynamics have not been targeted by most interventions (65). A recent review of structural stigma is likely to generate interest in creating effective multi-level de-stigmatization strategies (75). The high incidence and severe

consequences of untreated SAM add urgency to the need for greater attention to acute malnutrition-related stigma.

Limitations

The extent to which stigma is a barrier among any of the subgroups in this study is likely underestimated for several reasons. First, by nature, shame or discomfort may be difficult for a person to discuss or admit, which may have prevented some participants from listing it or responding positively when asked directly. Second, health workers are known to be sources of discrimination or judgment in many settings, which may have informed participants' choice of responses in this study (78,147). We emphasized the necessity of sensitive and respectful data collection during enumerator training to minimize this limitation, but our efforts may not have been adequate to put participants at ease or to offset caution learned from past negative experiences. Third, women for whom stigma was an especially strong barrier would be underrepresented in this facility-based study because they are unlikely to seek care. The facility-based aspect of this study means that it is not representative of the community at-large, and is only generalizable to women who accessed care. Fourth, our tool for measuring stigma did not attempt to separate the constructs of shame and guilt, two distinct psychological concepts that our research did not fully distinguish (148).

By using MUAC to categorize our MAM and SAM groups, we applied a relatively stringent definition for SAM. There are known discrepancies between the use of MUAC and WHZ as indicators, with MUAC being more predictive of mortality risk and less sensitive to weight or

body- mass index (125). The potential effect of classification differences on this study's results is unknown.

Conclusions

In addition to the many universal barriers faced by caregivers in accessing healthcare for children, most notably time and workload constraints of mothers, access to CMAM is additionally constrained by stigma associated with acute malnutrition. Shame and discomfort at health clinics were reported more frequently among mothers of children with moderate or severe acute malnutrition compared to those with children of normal status, and a majority of all participants perceived acute malnutrition as an indication of poor maternal or household provisioning.

If the experience of decades of HIV/AIDS research is indicative, we might expect efforts to address the stigmatization of acute malnutrition to have low priority (65). Yet in order to achieve maximum coverage of potentially life-saving CMAM programs, thoughtful consideration of barriers unique to CMAM must be made among researchers and programmers alike (62). Given the groundwork laid for conceptualizing stigma and its consequences for health outcomes (149), the existing precedents for effective de-stigmatization programs (146), and the capacity of child health and nutrition programs to influence caregiver behavior and improve coverage (63,88), many of the key requirements exist for successfully integrating de-stigmatizing interventions into existing platforms. Such efforts could be strengthened by research to identify the sources of stigma associated with acute malnutrition, along with

formative work to determine which approaches and targets for de-stigmatization efforts may be most appropriate and effective.

Chapter 5: Discussion

Summary

Global efforts to reduce the burden of acute malnutrition through supplementary and therapeutic feeding programs are increasingly accompanied by a range of strategies from disciplines other than nutrition, including development economics, medicine, and psychology. Simultaneously, efforts to improve access and coverage to the existing, conventional approaches to acute malnutrition are ongoing. This dissertation contributes to the study of acute malnutrition in two ways: first, it offers insight into whether and how emergency cash transfer programs (CTPs) are effective at preventing acute malnutrition during food crises; second, it documents stigma as a barrier to accessing treatment for acute malnutrition in routine health system settings. The findings are relevant and actionable, and will be of interest across the disciplines of emergency nutrition, humanitarian response, and development studies.

We presented a longitudinal analysis of risk factors associated with acute malnutrition risk among 453 children and households targeted by an emergency CTP in Maradi, Niger, during the 2012 food crisis (Chapter 2). We found that child dietary factors (meal frequency, dietary diversity, household food security, and food expenditures) were not significantly associated with the subsequent risk of acute malnutrition. Health and wealth-related factors had a larger and significant effect on risk, and we determined that the CTP alone was insufficient to offset the risk associated with illness or poverty.

Using a quasi-experimental study design, we evaluated the impact of a second emergency CTP on child health and diet, this time in Tahoua, Niger, also during the 2012 food crisis (Chapter 3). We observed substantial increases in weight and WHZ among program beneficiaries. The use of a comparison group and concurrent data on child diets allowed us to attribute the child growth to the intervention, with the qualifications as noted in Chapter 3, given that the diets and weights of non-beneficiaries remained unchanged for the duration of the study.

In a cross-sectional analysis of healthcare access barriers in Marsabit, Kenya, we investigated the role of stigma as a unique barrier to caregivers of children with acute malnutrition (Chapter 4). Shame and emotional discomfort at health clinics were reported most frequently among mothers of children with moderate or severe acute malnutrition relative to those with children of normal status, and a majority (75%) of all participants perceived acute malnutrition as an indication of poor maternal or household provisioning.

Synthesis

In this section we explore the possible reasons for the apparent divergence in outcomes between the two emergency CTPs in Niger, as presented in Chapters 2 and 3. We also consider the limitations of emergency CTPs as preventive tools for acute malnutrition, with particular attention to their ability (or lack thereof) to affect the health environment. Then we reflect on the importance of access and coverage to the success of Community-Based Management of Acute Malnutrition (CMAM) for the treatment of acute malnutrition in light of the current emphasis on

product development. To conclude, we offer suggestions for future research in the area of acute malnutrition prevention and treatment.

Consistency of emergency CTP outcomes

Although the outcomes of the Save the Children ("Save") and Concern Worldwide ("Concern") emergency CTPs presented in Chapters 2 and 3 may appear divergent at first, consideration of the methodological differences (and similarities) between the two programs shows them to be consistent with each other and with the recent work of others. The programs were comparable in many ways: they occurred in neighboring regions within the same country (Niger) and among the same ethnic group (the Hausa people); they were implemented in the same year (2012) and over approximately the same time period (May- October and July-October); they used similar targeting criteria (locally-defined HEA wealth categories) and distributed a similar amount of cash (250-296 USD); and, finally, they shared the goal of preventing acute malnutrition.

For all of the reasons listed above, one might expect the Save and Concern programs to have yielded similar impact. Programmatic and methodological differences lend insight into why they appear to have divergent results and what may be responsible for differences that did occur. First, Save's emergency CTP was an unconditional program (Chapter 2), whereas Concern's was conditioned on education sessions delivered parallel to the transfer distributions (Chapter 3). Second, Save's program was examined using a cohort study, whereas Concern's utilized a quasi-experimental study with a control group. The implications of these differences are presented below.

Programmatic differences: the role of conditional terms

As described in Chapter 3, the impact of the conditional education sessions as promoters of child feeding and care practices among beneficiaries of Concern's emergency CTP cannot be untangled from the impact of the cash itself. Nor should the importance of the sessions be overlooked; the strategic timing of their delivery—in the hour previous to cash distributions—and the resulting high adherence rate (99%) are both strong evidence that the messages were transmitted effectively. As the key defining feature between the Save and Concern programs, it seems likely that if there were a difference in impact it would likely be attributable to the difference in conditional status that ensured the delivery of nutrition education messages.

Systematic reviews of behavior change (BC) interventions have repeatedly demonstrated the potential for improving child dietary practices and nutritional status (9,150). Whether the duration of the cash intervention (4 months), the number of conditional sessions (3), or the quality and content of the sessions provided by Concern's emergency CTP were sufficient to yield the diet and growth changes observed is a reasonable question. In a recent review of 29 complementary feeding BC interventions, some with intense delivery platforms (daily sessions for 2-week periods) and others with just one session, the authors determined BC interventions to be "powerful" intervention strategies, despite being unable to determine whether length or intensity of the delivery platform was associated with greater impact (127). Thus it is plausible that even a small number of BC sessions of the type delivered through Concern's program could be effective.

Methodological differences: the use of cohort vs. experimental design

The study designs used to collect evaluate Save's and Concern's emergency CTPs lent themselves to different research questions. For Save's program (Chapter 2), we were able to explore the relevance of food and illness pathways by testing for associations between diet and health-related factors and our outcome of interest. As a cohort study with no comparison group, the data did not permit us to estimate the impact of the program through either pathway, but we were able to highlight the relative importance of child health status as a factor associated with subsequent malnutrition among children in beneficiary households. In contrast, for Concern's program (Chapter 3), which leveraged the availability of a comparison group, we were able to estimate impact and test the relevance of both pathways, leading to the conclusion that the program's impact was mediated through diet.

Neither Save's nor Concern's programs included food distribution as part of the CTP intervention, but the assumption underlying both programs was that the cash would increase food expenditures, thereby improving children's access to food and reducing their risk of acute malnutrition during the 2012 food crisis. Similar assumptions underlie many non-emergency programs as well (51). Only the quasi-experimental evaluation methods used for Concern's program allow us to explore the assumption. However, the lack of association found between dietary-related variables and the risk of acute malnutrition among beneficiaries of Save's program cannot be taken as an indication that there wasn't also an impact child diet and weight. In a related study using the same dataset, researchers showed that indicators of food security improved over time in the cohort households (55).

It is conceivable—and even likely, given the evidence from other studies—that beneficiaries of Save's emergency CTP did in fact experience meaningful increases in food expenditures, dietary indicators, and/or weight gain relative to non-beneficiaries (32). We do not rule out the likelihood that the overall risk of acute malnutrition was indeed lower among children in the cohort relative to non-beneficiaries. However, without a comparison group, we were unable to document such a result.

Emergency CTPs and child morbidity

Child illness was significantly associated with poor child growth outcomes in both of the emergency CTPs described in this dissertation, and we saw no evidence to indicate that either program reduced the frequency of illness. In Chapter 2, we concluded that an important role of emergency CTPs is (or should be) to enable access to medical care, given the prominent role that illness played in putting children at risk of acute malnutrition despite being targeted by Save's program. This conclusion was supported in Chapter 3, where Concern's program appears to have led to more frequent and prompt care-seeking behavior among beneficiaries of the CTP.

A likely reality is that the ability of emergency CTPs to have a substantial impact on child growth is constrained by underlying rates of child morbidity as well as limitations in health care access and quality. Even a program that successfully improves child diet is likely to hit a ceiling in terms of impact on growth unless morbidity is also addressed. The relative importance of the health environment was well documented in early work by Kennedy et al in Kenya (41), where

an agricultural and food-security intervention drastically increased beneficiary income and food expenditures but had no observable impact on child growth; any improvements in growth were associated with improvements in water and sanitation. More recently, interest in the role of co-infection in children with acute malnutrition has increased, and is being explored through trials that incorporate antibiotic treatment alongside RUTF (30,151). Even within the world of RUTF product development and testing, there is discourse about the appropriateness of promoting food-based interventions when health and sanitation conditions remain inadequate (152).

It would be naïve to posit that an intervention as temporary as an emergency CTP could result in a substantial improvements to the health environment via changes to water, sanitation, or health service infrastructure. While long term CTPs frequently include health systems strengthening components (38,47), emergency programs do not operate on a time scale suitable to such goals, nor do health systems or the health environment necessarily factor into the 'immediate relief' focus of humanitarian settings (4). However, our findings indicate that a potentially important and unsung role of emergency CTPs is to enable medical care for ill children where services exist, as well as to promote prompt care-seeking for ill children through the use of strategic conditional terms.

Prioritizing access and coverage of CMAM

Access and the 3/97 gap

As described in the introduction to this dissertation (Chapter 1), researchers from food science, psychology, medicine, child development, public health, and others are contributing resources towards achieving the most efficacious, cost-effective, and sustainable approach for the treatment of acute malnutrition. Most of this research revolves around product development and testing of RUF composition and new treatment protocols. Efforts to reduce the burden of acute malnutrition fall neatly into what Leroy and Habicht termed the "3/97" gap (153)—the observation that the vast majority of child health research and funding is dedicated to the development of new technologies, despite the evidence that child mortality could be reduced by 60% by scaling up currently available technologies (154).

Access is a prime example of an issue currently situated in the "3%" of the 3/97 gap: a small portion of current research is dedicated to understanding how to improve the coverage of the existing strategies for maternal and child health services. This imbalance persists despite the widely accepted knowledge that even the most efficacious and novel interventions are likely to fail unless vulnerable populations achieve access to health services (58,155). Convincing policy-makers, program implementers, researchers, and funders to prioritize coverage, when increasing efficacy remains so tantalizing, has proven to be challenging (59,156). Doing so for a program that professes to be "community-based", which implies high levels of access, may be especially problematic and counterintuitive.

The irony of a community-based intervention with poor coverage

CMAM access offers a particularly compelling and ironic case to consider: by all accounts, the design of CMAM meets expectations about what an "accessible" program should look like. Eligible children can receive treatment on an outpatient basis, mothers or caregivers can administer the treatment themselves, treatment is free, and the program has been integrated into public health systems across the globe. Optimizing coverage was precisely what Steve Collins had in mind when describing the motivations originally behind the program (9,10). Based on the standards for scaling-up child survival programs touted over the last decade, CMAM should be one of the most highly accessed programs around (155). So why, then, is coverage so low?

This dissertation and other related work on the topic of coverage of CMAM have begun to document and consider the extent of the problem, with the emerging consensus being that CMAM coverage is probably no better than that of other child health or nutrition services, despite the intent behind its design (15,60,62,63). In fact, our findings raise the possibility that the stigmatization of acute malnutrition constrains CMAM coverage beyond that of programs or conditions where stigma is not an issue. Using the RE-AIM framework and language to situate our findings from in Kenya, we propose that CMAM has limited reach due to the many formidable barriers that occur universally for maternal and child health services, foremost women's time and labor constraints. Furthermore, the stigmatization of acute malnutrition contributes to the constrained adoption of CMAM (59).

In other words, all else equal, it's possible that coverage of CMAM is more difficult to achieve than other child health services due to the stigmatization of acute malnutrition.

It is conceivable that increased awareness and appreciation of acute malnutrition-associated stigma among policymakers and implementers could motivate improvements to CMAM coverage. Whereas the more common barriers to maternal and child health services can seem insurmountable, and therefore unappealing as policy or program targets, de-stigmatization may be relatively actionable. As detailed in our discussion of de-stigmatizing acute malnutrition in Kenya (Chapter 4), some of the key requirements for integrating de-stigmatization efforts into existing platforms already exist. It remains to be seen whether CMAM coverage, including the role of stigma, will gain priority among the many other tactics being used to address the burden of child acute malnutrition.

Concluding remarks

There remains a need for more rigorous evaluation of emergency CTPs and their impact on child health and nutrition. Opportunities to leverage the use of comparison or control groups, as was achieved by Concern in 2012, should be sought to aid in the quantification of program impact. Doing so will help to substantiate and justify the continued proliferation of CTPs in humanitarian settings. Study designs that allow an assessment of the relative contribution of cash and conditional terms in emergency CTPs would further illuminate the mechanisms by which these programs yield a meaningful effect.

The extent to which stigma prevents acutely malnourished children from getting treatment would be better understood through community-based studies with caregivers not accessing treatment. Qualitative work could elucidate sources and consequences of stigma with greater nuance and depth, and more sophisticated survey tools should be constructed to reflect contemporary conceptualizations of stigma. Whether stigma is in fact a widespread or formidable barrier to accessing care has yet to be established and requires more attention.

To conclude, the prevention and treatment of child acute malnutrition will both benefit from a more holistic approach to program design and evaluation. This dissertation demonstrated how integrating food, health, and care components into emergency cash transfer programming is fundamental to preventing acute malnutrition in the context of a food crisis. It also identified stigma as an important barrier to accessing treatment in a routine healthcare setting. With continued collaboration across disciplines and more emphasis on strengthening the coverage of existing programs, the burden of child acute malnutrition stands the greatest chance of decline.

APPENDIX A

TABLE A1. Summary of findings from emergency and short-term cash transfer program evaluations

Study & authors	Program type	Program description	Study design	Findings
The role of unconditional cash transfers during a nutritional emergency in Maradi region, Niger: a pre-post intervention observational study (Fenn et al 2014)	Emergency, unconditional	6 months of cash transfers (55 USD/mo.) to households at risk of food and crop failure during a food crisis	Observational: Cohort of 453 HHs with 1 target child identified per HH followed monthly for 6 months. No comparison group.	Household poverty and food security indicators improved, as did child dietary diversity and anthropometric measures of wasting.
External evaluation: Fresh food voucher project by Action Against Hunger, Dadaab Refugee Camps, Kenya (Dunn 2010)	Emergency, unconditional	11 months of fresh food vouchers to refugee households (valued 7 USD/mo.)	Observational: Pre-post HH surveys conducted. No comparison group.	The rate of acute malnutrition declined from 25.6% to <12% and measures of household dietary diversity improved.
An evaluation of Concern Worldwide's Dowa Emergency Cash Transfer Project in Malawi (Devereux et al 2007)	Emergency, conditional	12 months of transfers totaling 30 USD, conditional upon attendance at educational sessions covering agriculture and health messages	Observational: Pre-Post surveys of 509 HHs at baseline, 250 HHs at endline. No comparison group.	Households increased meal frequency over time.

(Table A1 continued)

Study & authors	Program type	Program description	Study design	Findings
Review of the impact of cash transfers on child nutrition in the Delta of Myanmar (Sibson 2011, in Bailey and Hedlund 2012)	Emergency, conditional	Cash transfers (65 USD), food, and nutrition education given to women with acutely malnourished children.	Observational: Pre-Post surveys. No comparison group.	The rate of acute malnutrition declined from 6.6% to 2.6%, and the percentage of households reporting food security rose from 25 to 94%.
How cash transfers can improve the nutrition of the poorest children: Evaluation of a pilot safety net project in Southern Niger (Save the Children 2009)	Emergency, unconditional	3 months of CTs targeted poor HHs (120 USD total)	Pre-, mid-, post surveys of 100 HHs. No comparison group.	Households increased purchase and consumption of milk, oil, and meat, no change in mean WHZ.
Zap it to me: The short-term effects of a mobile cash transfer program [in Niger] (Aker 2011)	Emergency, unconditional	Cash transfers given to HHs over 5 months (215 USD total)	Experimental: HHs received cash via phone or envelope. No true control; comparisons made across 2 intervention types.	Households who received transfer via phone had higher measures of dietary diversity.

(Table A1 continued)

Study & authors	Program type	Program description	Study design	Findings
Cash grant supported income generating activities in Southern (Sloane & Pietzsch 2010)	Post-conflict, short term	Transfers (138 USD) given to 77 groups of HHs with children at risk of malnutrition to support business development.	Observational: 55 pre-post surveys with 51 individuals. No comparison group.	The proportion of children with MUAC >135mm increased from 24% to 64%.
Cash, food, or vouchers? Evidence from a randomized experiment in Northern Ecuador (Hidrobo et al 2014)	Short-term, non-emergency, unconditional	6 months of either cash (40 USD/mo.), food, or vouchers distributed to poor and refugee households	Experimental: Cluster randomized with pre- and post- surveys of 2,100 HHs. No true control, comparisons made across 3 intervention types.	Cash, food, and vouchers all improved quantity and quality of food consumed. Food arm had increased calories, voucher arm had increased dietary diversity, and cash arm had less attrition.
The impact of cash and food vouchers: Evidence from a randomized intervention in Niger (Hoddinott et al 2014)	Short-term, non-emergency, conditional (work-for-cash/food)	6 months of either cash or food to households participating in public works projects (max. 50 USD/mo.)	Experimental: Cluster randomized with pre and post surveys of 2209 HHs. No true control, comparisons made across 2 intervention types.	Households receiving food basket had greater improvements in food consumption and diet quality than those receiving cash.
The impact of the Social Cash Transfer Scheme on food security in Malawi (Miller et al 2011)	Short-term, non-emergency, unconditional	1 year of cash transfers (14 USD/mo.) to poorest 10% of population.	Experimental: Cluster randomized controlled trial with pre, mid, and post-surveys of 819 HHs. Control group possible due to rolling program enrollment.	Intervention households had significantly higher food expenditures, dietary diversity, and food security measures.

TABLE A2. Summary of findings from studies of access to health services for children under five, emphasizing studies from Kenya

Study title and authors	Country and condition	Study design	Findings
Improving access to health care for malaria in Africa: a review of literature on what attracts patients. (Kizito et al 2012)	African continent/ Malaria	Review of 97 papers to identify provider characteristics attractive to people seeking malaria treatment in Africa. No comparison group.	-Low cost, proximity, provider-caregiver interactions, timeliness of services, and belief in curative power of treatment all indicative of treatment seeking.
Use of curative care for fever, acute respiratory illness, and diarrhea among children in rural DRC. (Dissertation excerpt- Kwilu 2010)	Democratic Republic of Congo/ Diarrhea	Descriptive cross-sectional analysis of World Bank household survey (n=5,860) . No comparison group.	-Lower cost of care was associated with increased odds of seeking treatment. -Hospital use was lowest among poorest households.
Determinants of coverage in community-based therapeutic care programmes: towards a joint quantitative and qualitative analysis. (Guerrero et al 2010)	DRC, Ethiopia, Malawi, Niger, and N&S Sudan/ SAM	Descriptive, retrospective cross-sectional analysis of qualitative and quantitative survey data (n=1,696). No comparison group.	-Multiple factors cited with poor coverage, including previous rejection, lack of awareness of condition, lack of trust in program, distance to program, and shame.
Barriers to prompt and effective malaria treatment among the poorest population in Kenya. (Chuma et al 2010)	Kenya/ Malaria	Descriptive cross-sectional survey of mothers (n=708), FGD (n=24), semi-structured interviews w/health workers (n=34), patient exit interviews (n=359). No comparison group.	- Affordability (treatment costs) and awareness (of seriousness of illness) were main barriers found via quantitative analysis. - Qualitative analysis revealed that acceptability (provide-patient relationship) and availability (facility hours) were also significant factors.

(Table A2 continued)

Study title and authors	Country and condition	Study design	Findings
Factors associated with utilization of community health workers in improving access to malaria treatment among children in Kenya. (Kisia et al 2013)	Kenya/ Malaria	Descriptive two-stage cross-sectional household survey (n=1,187 and 1,374) in 113 villages with community health workers (CHWs). No comparison group.	-Remote location was a barrier to clinic-based services. -Higher rates of prompt and effective treatment were observed when CHWs were the source of care sought, especially among poorest households in small villages.
Who is to blame? Perspectives of caregivers on barriers to accessing healthcare for under-fives in Butere District, Western Kenya. (Opwora et al 2011)	Kenya/ General services	Descriptive cross-sectional exit survey of hospital patients (n=397), FGDs in community (n=45). No comparison group.	-Lack of money for transport and fees, long waiting times, and past poor experiences were all cited as barriers to access. -Traditional healing sources sought prior to western sources.
Factors associated with appropriate diarrhea case management in hospitalized children under five in Nyanza Province, Kenya. (Masters thesis-Weaver 2010)	Kenya/ Diarrhea	Descriptive cross-sectional exit interviews with mothers (n=122). No comparison group.	-Fear that child will die, confidence in ability to prepare ORS, and advice from multiple people to use ORS all improved odds of ORS use.
Ecological and cultural barriers to treatment of childhood diarrhea in riverine areas of Ondo State, Nigeria. (Iun and Oke 2000).	Nigeria/ Diarrhea	Descriptive cross-sectional survey of mothers (n=308), in-depth interviews with key informants (n=42). No comparison group.	- Lack of awareness of ORS and lack of experience with ORS prevented use of ORS therapy. - Preferences for herbal remedies and the presence of drug peddlers contributed to under-use of ORS.

(Table A2 continued)

Study title and authors	Country and condition	Study design	Findings
Health system weaknesses constrain access to PMTCT and maternal HIV services in South Africa: a qualitative enquiry. (Sprague et al 2011).	South Africa/ HIV	Descriptive cross-sectional study consisting of in-depth interviews with HIV-positive female patients (n=83), female caregivers of HIV-positive children (n=32), and key informants (n=38). No comparison group.	-Psychosocial concerns, including fear of positive test results, fear of partner's response, and stigma cited as "individual" barriers to access. -Poor or judgmental attitudes of health workers led to testing refusals.
Access to antiretroviral therapy for adults and children with HIV infection in developing counties: Horizons Studies, 2002-2008. (Sarna et al 2010)	Global/ HIV	Review of ART studies from 11 programs in Asia and sub-Saharan Africa. No comparison group.	-Lack of awareness about where to access HIV testing and treatment services for children, stigma, and costs all cited as barriers to seeking care for child HIV.
If you build it, will they come? Kenya healthy start pediatric HIV study: a diagnostic study investigating barriers to HIV treatment and care among children. (Kiragu et al 2008).	Kenya/ HIV	Descriptive cross-sectional survey of 1,182 individuals within 15k of HIV treatment facilities, key informant interviews (n=97). No comparison group.	-Cost was the primary access barrier to pediatric treatment of HIV. -Misconceptions about HIV, fear, and the belief that children with HIV are "lost causes" also cited as substantial barriers.

TABLE A3 Baseline livestock assets in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, by treatment group[1]

Variable	Comparison group	Cash group	Factor loading
Cattle	0, 0-0	0, 0-0	0.46
Goats	0, 0-0	0, 0-0	0.55
Sheep	0, 0-0	0, 0-0	0.31
Poultry	0, 0-0	0, 0-0	0.45
Camels or horses	0, 0-0	0, 0-0	0.44
Any livestock owned, n (%)	44 (21)	55 (26)	

[1] Values are medians, inter-quartile ranges of the number of livestock owned by the household at the initial time point unless otherwise noted.

TABLE A4 Changes and double differences in anthropometric characteristics among non-wasted participants (initial weight-for-height Z (WHZ) >-2) in an evaluation of Concern Worldwide's emergency cash transfer program in Tahoua, Niger, by treatment group[1]

Variable	Comparison group	Cash group	Double diff.	P-value [2]
Percent of group with WHZ>-2 at the initial measure (172, 145)	81	68	13	0.00
Change in weight (kg) (171, 145)	0.27 ± 1.8	1.55 ± 2.0	1.28	0.00
Change in weight among children 12-24 months old initially (kg) (85, 70)	0.17 ± 1.7	1.89 ± 1.9	1.72	0.00
Weight gain velocity (g/kg/day) (171, 145)	0.83 ± 3.5	3.39 ± 4.2	2.56	0.00
Change in WHZ [3] (125, 118)	-0.47 ± 1.2	1.21 ± 1.2	1.69	0.00
Change in MUAC (mm) (172, 145)	-3.56 ± 13.2	3.2 ± 12.5	6.80	0.00

[1] Changes are from the initial measurement until the final measurement. Values are mean ± standard deviation. The number of observations is noted in parentheses, with the comparison group sample size preceding the cash group. [2] P-values are reported for t-tests comparing mean differences. [3] WHZ for children whose linear growth exceeded plausible limits over the 2-month period of study were excluded from analysis. For this reason, the number of observations for anthropometric indicators varies. Criteria for plausibility are described in the methods section of Chapter 3.

TABLE A5 Household assets in a survey of access to health services at rural facilities in Marsabit County, Kenya [1]

	Normal Group (n=289)	MAM Group (n=259)	SAM Group (n=163)	Factor loading
Lantern	200 (69)	166 (64)	104 (263)	0.01
Cart	18 (6)	17 (7)	4 (2)	0.04
Hoe	164 (57)	147 (57)	88 (54)	0.07
Clock	42 (15)	20 (8)	14 (9)	0.30
Radio	68 (24)	41 (16)	20 (13)	0.30
Television	23 (8)	9 (4)	10 (6)	0.36
Car battery	29 (10)	19 (7)	5 (3)	-0.02
Electricity	25 (9)	12 (5)	15 (9)	0.38
Generator	3 (1)	2 (1)	2 (1)	0.16
Tape player	24 (8)	7 (3)	1 (1)	0.31
Bike	13 (5)	3 (1)	4 (3)	0.13
Motorcycle	14 (5)	6 (2)	4 (2)	0.24
Phone	107 (37)	67 (26)	38 (23)	0.34
Tin roof	82 (28)	56 (22)	45 (28)	0.32
Latrine	109 (38)	73 (28)	54 (33)	0.32
Running water	9 (3)	6 (2)	2 (1)	0.06
Mosquito net	162 (56)	136 (53)	91 (56)	0.13

[1] Values are the n (%) of households in each group owning at least one of the respective assets.

TABLE A6 Measures of food security among participants in a survey of access to health services at rural facilities in Marsabit County, Kenya [1]

	Normal Group (n=289)	MAM Group (n=259)	SAM Group (n=163)	Factor loading
In the last 4 weeks, was there ever a time when…				
You were unable to eat healthy and nutritious foods, like milk, meat, eggs, green vegetables, or fruit?	120 (42)	121 (48)	91 (57)	0.34
You worried you might run out of food?	119 (42)	131 (52)	96 (60)	0.51
There was no food in your household?	73 (26)	105 (42)	75 (47)	0.50
You or any household member went to sleep at night hungry because there was not enough food?	79 (28)	98 (39)	68 (43)	0.49
You or any household member went a whole day and night without eating anything because there was not enough food?	39 (14)	40 (16)	35 (22)	0.38

[1] Values are n (%).

APPENDIX B

SUPPLEMENT B1 Survey instrument used for longitudinal study in Maradi, Niger (Chapter 2)

MMS STUDY - HOUSEHOLD QUESTIONNAIRE BASELINE
(COMPLETE ONE QUESTIONNAIRE PER CARER OF [NAME] IN HH)

FILL IN AS MUCH AS POSSIBLE BEFORE VISITING HH

Date : _____/_____/_____DD/MM/YYYY	[DATE]	Team number: [_____]	[TNUM]
Commune NAME: _____	[COMNAM]	Commune number: [_____]	[COMNUM]
Village NAME: _____	[CLNAM]	Village Number: [_____]	[CLNUM]
Head of HH name _____	[HHNAM]	HH number: [_____]	[HHNUM]
CHILD ID# [_____]			
Contact Number:			
How many years has this family lived in this village? [_____]			

Interviewed by:
Data entry by:_____ Data checked / double entered by:_____
Who is answering the questions? CODE BOX 1 [_____]

SECTION 1: HOUSEHOLD DEMOGRAPHY

RECORD INFORMATION FOR **EACH** FAMILY MEMBER. FIRST THE HEAD OF THE HOUSEHOLD FOLLOWED BY PRIMARY CARER AND THEN THE SELECTED CHILD THEN THE OTHER FAMILY MEMBERS IN ORDER OF AGE - **ONLY INCLUDE PEOPLE WHO ARE CURRENT HH MEMBERS – NOT VISITORS OR FAMILY MEMBERS LIVING AWAY PERMANENTLY. ALSO RECORD DETAILS FOR ANYONE WHO DIED IN THE HOUSEHOLD IN THE LAST 3 MONTHS AND FOLLOWING MONTHS**

1	A	B	C	D	E	F	G

Number **[FAMNUM]**	**Name (PRINT)** **[HHNAME]**	**Family Position (use Code Box #1)** **[HHPOS]**	**Age (years)** **[HHAGE]**	**Sex (M/F)** **[HHSEX]**	**Highest schooling level** 00=None 01= Primary 02=Secondary 03= Informal **[HHSCH]**	**Read &/or write in French?** 00=No 01= Read only 02= Write only 03=Both **[HHLANG]**	**Died (in past 3 months)** 00= No 01= Yes **[HHDEAD]**	**CODE BOX #1**
01 **[HHEAD]**								01 = Father
02 **[PCARE]**								02 = Mother
03 **[NAME]**		CHILD						03 = CHILD
04								04 = Grandparent
05								05 = Sibling
06								06 = Other relative
07								07 = Non-relative
08								
09								
10								
11								
12								
13								

2	**Religion of Head of Household** 00=None 01= Muslim 02=Christian 03=Animist 77=Other		[REL]
3	**Ethnicity of Head of Household** 01= Hausa 02=Djerma-Songhai 03= Fulani or Peul 04= Tuareg 05=Beri Beri or Kanouri 77=Other		[ETH]
4	**Language of Head of Household** 01= Hausa 02=Zarma and Songhai 03= Fulfulde 04=Kanuri 77=Other		[LANG]

SECTION 2: Wealth & Employment

5	**Wealth group (by HEA)**	[____]	[WEALTHHEA]

	01= Better-off 02=Medium 03=Poor 04=Very poor		
6	**How many people are in any kind of wage employment in the household?** NUMBER	[____]	[EMPLOYNUM]

Record the CURRENT job description and employment status of each family member who is currently in employment. USE THE SAME CODES AS IN TABLE ABOVE – SECTION 1.

7	A	B	C	D	E	F
No (FROM TABLE1 ABOVE)	**Job description** CODE BOX #2 **[JOB]**	**Employment status** 01=Permanent full time 02= Permanent part time 03 = Temporary full time 04 = Temporary part time **[EMPLOY]**	Hours per week **[HOURS]**	How is this paid? 01=Wage 02=In kind 03=Both **[PAID]**	Income received this month (local currency) **[INCOME]**	Was your income higher this month than last? 00=No 01=Yes 02=Same **[INCINC]**

CODE BOX #2	
00 = Unemployed	03 = Skilled manual
01 = Working in agriculture	04 = Non manual
02 = Unskilled manual	

SECTION 3: Income/Expenditure

Now I want to ask you some questions regarding items you bought in the last week FOR THE THREE CATEGORIES BELOW

8	A	B	C
	What was the total expenditure for the Household last WEEK? Local currency **[HHEXPF]**	**Have you spent more money on your children (6-59 months) this month compared to last month?** **00=No change** **01=Increase (GO TO D)** **02=Decrease** **[MINC]**	**What was the MAIN source of this money?** **01=Cash transfers** **02=Savings/microfinance** **03= Sale of assets** **04=Other source** **[SOURCE]**
Food items	[_____] **[HHEXPF]**	[_____] **[MINCF]**	[_____] **[WMINCF]**
Medical	[_____] **[HHEXPM]**	[_____] **[MINCM]**	[_____] **[WMINCM]**
Other Non-food items	[_____] **[HHEXPN]**	[_____] **[MINCN]**	[_____] **[WMINCN]**

9	A
	What was the total expenditure for the Household last WEEK? Local currency **[HHEXPF]**
Food items	[_____] **[HHEXPFM]**
Medical	[_____] **[HHEXPMM]**
Other Non-food items	[_____] **[HHEXPNM]**

SECTION 4: Facilities and infrastructure

10	Which health facility (health facility/centre/ health post) does the carer use? 00=None >> go to Q13 01=Health centre 02=Health hut	[____]	[HEALTHFAC]

	03=District hospital 04=Mobile drug shops 05=Traditional healer 77=Other (specify)_____		[HEALTHFACSP]
11	How long does it take to get there? MINUTES	[____] minutes	[HEALTHMIN]
12	**If this health facility is NOT the nearest one** Why do you not use this one? *00= It is the nearest 01=Better quality 02=Better staff 03=More drugs 77=Other* ***Other, specify_____***	[____]	[HEALTHWHY] [HEALTHWHYSP]
13	What is the **main** source of drinking water for the members of this HH? ***Only one answer*** *01=Standpipe 02=Hand pump 03=Protected dug well 04=Unprotected dug well 05=Rain water 06=River/stream 77=Other* **Other, specify_____**	[____]	[WATER] [WATERSP]
14	How long does it take to collect water (go and come back)? MINUTES	[_____] minutes	[TIMWAT]
15	Do you store water? *01=Yes 00=No* ***If no skip>>18***	[____]	[STORWAT]
16	If Yes, may I see the containers please? *01=Yes 00=No* ***If no skip>>18***	[____]	[STORSEE]
17	*OBSERVE THE WATER STORAGE CONTAINERS/ CHECK AND SEE IF THEY ARE NARROW NECKED OR COVERED* *01=All containers narrow necked or covered 02=Some are narrow necked or covered 03=None are narrow necked or covered*	[____]	[CONTWAT]

18	What kind of toilet facility does this household use? ***Only one answer*** *01=Flush toilet/septic tank 02=Pit latrine (household) 02=Pit latrine (public) 03=Bush/ditch 77=Other, specify_____*	[_____]	[TOILET]
19	Do you have soap in this household? ***(Ask to see the soap)*** *00=No 01=Yes, soap 02=Yes, sand 03=Yes, soap or sand*	[_____]	[SOAP]
20	Have you used soap today or yesterday? *00=No 01=Yes*	[_____]	[SOAPUSE]

21	*OBSERVATION ONLY: IS THERE A HANDWASHING DEVICE SUCH AS A TAP, BASIN, BUCKET, SINK ETC IN THE COMPOUND?* *00=No 01=Yes*	[_____]	[TAP]
22	*OBSERVATION ONLY: IS THE INSIDE OF THE HOUSE SWEPT AND CLEAN?* *00=Not swept 01=Well swept 02=Partially swept*	[_____]	[CLEAN]
23	*OBSERVATION ONLY: ARE THERE ANY ANIMAL OR HUMAN FAECES AROUND THE FRONT OF THE HOUSE (WITHIN 3M OF THE FRONT DOOR OR WITHIN THE HH COMPOUND)?* *00=No 01=Yes*	[_____]	[ANIMAL]

SECTION 5: Social capital (Women's status and autonomy)

24	Are you or any member of the household a member of any organisation? 00=No 01=Yes 88 = refused 99=Don't know **If yes >> 25 otherwise SKIP>>26**	[_____]	[WORG]
25	If yes, record all answers from Code Box #3 77= Other, specify? _____	[____] [____] [____] [____]	[WORG1] [WORG2] [WORG3] [WORG4] [WORGSP]

CODE BOX #3	
01 = Woman's cooperative	04 = Village development committee
02 = Students' parent association	77 = Other
03 = Villager's agricultural society	

26	Are you or any member of the household *currently* a beneficiary of any *other* programme(s) (i.e. not including the cash transfer)? *00=No 01=Yes 88 = refused 99=Don't know* ***If yes >> 27*** **otherwise SKIP>>28**	[_____]	[WPGM]
27	If yes, record all answers from Code Box #4 ***77= Other, specify?*** _____	[____] [____] [____] [____]	[WPGM1] [WPGM2] [WPGM3] [WPGM4] [WPGMSP]
28	Have you or any member of the household received a cash transfer or been a beneficiary of any other programme in the past year? *00=No 01=Yes 88 = refused 99=Don't know* ***If yes >> 29*** **otherwise SKIP>>30**	[_____]	[PPGM]
29	If yes, record all answers from Code box #4	[____]	[PPGM1] [PPGM2]

	77= Other, specify? : _____	[_____] [_____] [_____]	[PPGM3] [PPGM4] [PPGMSP]

CODE BOX #4	
01 = Save the Children	06 = Government
02 = Care	07 = Friends/visitors
03 = MSF	08= Cash transfer
04 = UNICEF	77 = Other
05 = PAM	

30	Sometimes a husband is annoyed or angered by things which his wife does. In your opinion, is a husband justified in beating his wife in the following situations: 1. If she goes out without telling him? 2. If she neglects the children? 3. If she argues with him? 4. If she refuses sex with him? 5. If she burns the food? **00=No 01=Yes 88=refused**	[_____] [_____] [_____] [_____] [_____]	[WSTAT1] [WSTAT 2] [WSTAT 3] [WSTAT 4] [WSTAT 5]

31	Who in your family usually has the final say on the following decisions? 1. Your own health 2. Large household purchases 3. Daily household purchases 4. Visits to family, friends, or relatives 5. Food to be cooked each day 6. Number of children and when **01 = themselves (respondent) 02= husband/partner 03= respondent and husband/partner jointly 04= someone else 05= respondent and someone else jointly 88=refused**	[_____] [_____] [_____] [_____] [_____] [_____]	[WDEC1] [WDEC 2] [WDEC 3] [WDEC 4] [WDEC 5] [WDEC 6]

SECTION 6: Food Security

32	In the past month: Was there ever no food to eat of any kind in your household because of lack of resources to get food? 00= No 01=Rarely 02=Sometimes 03=Often	[_____]	[HFIAS1]

33	In the past month: Did you or any household member go to sleep at night hungry because there was not enough food? 00= No 01=Rarely 02=Sometimes 03=Often	[_____]	[HFIAS2]
34	In the past month: Did you or any household member go a whole day and night without eating anything because there was not enough food? 00= No 01=Rarely 02=Sometimes 03=Often	[_____]	[HFIAS3]

35	*OTHER OBSERVATIONS OF THE LIVELIHOODS PROFILE OF THE HOUSEHOLD AND HH ASSETS: How many of each of the following does the household have?* 1. Donkey cart 2. Hand plough 3. Pump 4. Well	 [____] [____] [____] [____]	 [HASSET1] [HASSET2] [HASSET3] [HASSET4]

PLEASE DESCRIBE THE FOODS (MEALS AND SNACKS) THAT YOU [RESPONDENT] ATE YESTERDAY DURING THE DAY AND NIGHT, WHETHER AT HOME OR OUTSIDE THE HOME. START WITH THE FIRST FOOD EATEN IN THE MORNING

WRITE DOWN ALL FOOD AND DRINKS MENTIONED BY THE RESPONDENT. WHEN THE RESPONDENT HAS FINISHED, PROBE FOR MEALS AND SNACKS NOT MENTIONED. THEN ASK IF THE SAME FOOD WAS EATEN BY THE FATHER. IF NO FILL IN THE SECTION BELOW FOR THE DIFFERENT FOODS THE FATHER ATE

36	**A**	**B**	**C**	**D**	**E**	**F**
	Breakfast	**Snack**	**Lunch**	**Snack**	**Dinner**	**Snack**
Mother (RESPONDENT)						
Father						

WHEN THE RESPONDENT RECALL IS COMPLETE, FILL IN THE FOOD GROUPS BASED ON THE INFORMATION RECORDED ABOVE. FOR ANY FOOD GROUPS NOT MENTIONED, ASK THE RESPONDENT IF A FOOD ITEM FROM THIS GROUP WAS CONSUMED YESTERDAY DURING THE NIGHT AND DAY.

37	**Food Group**	**Examples**	***00=No; 01=Yes***	
A	CEREALS	corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products) + *local foods e.g. ugali, nshima, la boule, other porridge or pastes or*	[_____]	[HCEREAL]

		other locally available grains		
B	VITAMIN A RICH VEGETABLES AND TUBERS	carrots, squash, or sweet potatoes that are orange inside + *other locally available vitamin-A rich vegetables (e.g. red sweet pepper)*	[_____]	[HVITAVEG]
C	WHITE TUBERS AND ROOTS	white potatoes, white yams, white cassava, or other foods made from roots (e.g. garin rojo)	[_____]	[HTUBER]
D	DARK GREEN LEAFY VEGETABLES	dark green/leafy vegetables, including wild ones + *locally available vitamin-A rich leaves e.g. amaranth, cassava leaves, spinach, moringa etc., baobab*	[_____]	[HDARKGN]
E	OTHER VEGETABLES	tomato, onion, eggplant, cabbage, including wild vegetables, okra	[_____]	[HOTHVEG]
F	VITAMIN A RICH FRUITS	ripe mangoes, ripe papaya, + *other locally available vitamin A-rich fruits*	[_____]	[HVITAFRU]
G	OTHER FRUITS	other fruits, bananas, orange, pineapple, including wild fruits	[_____]	[HOTHFRU]
H	ORGAN MEAT (IRONRICH)	liver, kidney, heart or other organ meats or blood-based foods	[_____]	[HIRONMEAT]
I	FLESH MEATS	beef, lamb, goat, wild game, chicken, duck, guinea hen, guinea fowl, or other birds	[_____]	[HFLESH]
J	EGGS	chicken, duck, guinea hen or any other egg	[_____]	[HEGGS]
K	FISH	fresh or dried fish	[_____]	[HFISH]
L	LEGUMES, NUTS AND SEEDS	beans, peas, lentils, ground nuts or other nuts, seeds or foods made from these	[_____]	[HLEGUMES]
M	MILK AND MILK PRODUCTS	milk, cheese, yogurt or other milk products, powdered milk	[_____]	[HMILK]
N	OILS AND FATS	oil, fats, butter or margarine added to food or used for cooking	[_____]	[HOIL]
O	SWEETS	sugar, honey, sweetened soda or juice, sugary foods such as chocolates, candies, biscuits and cakes	[_____]	[HSWEET]
P	SPICES, CONDIMENTS, BEVERAGES	Spices (black pepper, salt), condiments, coffee, tea, alcoholic beverages OR *local examples*	[_____]	[HSPICE]

38	Did you or anyone in your household eat anything (meal or snack) OUTSIDE of the home yesterday? 00= No 01=Yes	[_____]	[HCONOUT]
39	During mealtime who in the family gets to eat first? 01= Father/males 02=Mother/females 03=Children 04=All adults first 05=Children first 06=Eat together	[_____]	[HHFDDIST]

SECTION 7: Mother's health

40	In the past month: Have you been suffering from any illness that has caused you to rest more than usual? 00= No 01= Yes, but not too bad 02=Yes, much more	[_____]	[WHEALTH]

PLEASE ANSWER YES OR NO TO THE FOLLOWING QUESTIONS – CIRCLE YES OR NO

41				

1	Do you often have headaches?	YES	NO	
2	Is your appetite poor?	YES	NO	
3	Do you sleep badly?	YES	NO	
4	Are you easily frightened?	YES	NO	
5	Do your hands shake?	YES	NO	
6	Do you feel nervous, tense or worried?	YES	NO	
7	Is your digestion poor?	YES	NO	
8	Do you have trouble thinking clearly?	YES	NO	
9	Do you feel unhappy?	YES	NO	
10	Do you cry more than usual?	YES	NO	
11	Do you find it difficult to enjoy your daily activities?	YES	NO	
12	Do you find it difficult to make decisions?	YES	NO	
13	Do you find it difficult to carry out your daily work/chores properly?	YES	NO	
14	Are you unable to play a useful part in life?	YES	NO	
15	Have you lost interest in things?	YES	NO	
16	Has the thought of ending your life been on your mind?	YES	NO	
17	Do you feel tired all the time?	YES	NO	
18	Do you have uncomfortable feelings in your stomach?	YES	NO	
19	When you start to work do you get tired quickly?	YES	NO	
	SCORE	[ ]		[SDQ20]

SECTION 8: Child Protection and Education

42	Are there any children who have left the household since September 2011? 00=No 01=Yes 99=Don't know ***If yes >> 43*** **otherwise SKIP>>45**	[ ]	[CHLEAVE]
43	Why did they leave? Please record the *main* reason. 01=Not enough food in the house 02=Needed to contribute to the household income 03=Family breakdown 77=Other (specify)_____	[ ]	[CHLEAVEW]

44	What did they do? Please record the *main* option. 01=Domestic work 02=Street work/petty trading 03=Marriage 77=Other(specify)_____ 99=Don't know	[ ]	[CHLEAVEDO]

45	What are the children who have not left home doing during the day? Please record the *main* activity including the no.of hours spent doing it per day: 01=School / no. of hours 02=Domestic work / no. of hours 03=Play / no. of hours 04=Look after siblings / younger children / no. of hours 05=Herding animals / no. of hours 06=Helping parents with other income generating activities / no. of hours 77=Other (specify)_____	Activity Hr/day [____] [____]	[CHHOME]
46	How many children in the household are attending school this year? 1. Boys 2. Girls	[____] [____]	[CHSCH1] [CHSCH2]
47	How many children have been attending school since the beginning of September 2011, and are still attending? 1. Boys 2. Girls	[____] [____]	[CHSCHYR1] [CHSCHYR2]
48	Are there any children who have left school? 00=No 01=Yes ***If yes >>49*** **otherwise SKIP>>50**	[____]	[CHQUITSC]
49	Why did they leave school ? 01= Cost of education 02=The need for children to work 03=To take care of younger siblings 77=Other (specify)_____	[____]	[CHQUITSCW]

50	Are there any children in the household who have been admitted to the nutritional rehabilitation centre in the last 3 months? 00=No 01=Yes	[_____]	[CCMAM]

SECTION 9: Coping mechanisms

51	Have you had to sell any household assets during the past month? 00=No 01=Yes ***If yes >>52*** **otherwise SKIP>>54**	[_____]	[ASSET]
52	If yes, why was this? **RECORD ALL THAT APPLY** 01 = Repay debts 02 = Festivals 03 = Funeral 04 = Illness 05 = Extra food 06 = Livestock drugs/vet bills 07 = Water for animals 08 = Community obligations 09 = Taxes 10 =Transport 11 = To buy phone credit 77 =Other, specify_____	[_____] [_____] [_____] [_____] [_____] [_____] [_____] [_____] [_____] [_____] [_____]	[ASSET1] [ASSET2] [ASSET3] [ASSET4] [ASSET5] [ASSET6] [ASSET7] [ASSET8] [ASSET9] [ASSET10] [ASSET11] [ASSETOTH] [ASSETOTHSP]
53	**Specify what asset you have sold (e.g. land..)_____**		[ASSETSP]

54	Est-ce qu'il y a des membres du foyer qui sont partis en exode au cours du dernier mois? Are there any household members who have left on exode *(i.e. migration for labour)* in the past month? 00=No 01=Yes ***If yes >>55*** **otherwise SKIP>>56**	[_____]	[HEXODE]
55	How many people left on exode?	[_____]	[HEXODENO]
56	Do you have any debts? 00=No 01=Yes ***If yes >>57*** **otherwise SKIP>>58**	[____]	[HDEBT]
57	How much debt do you have? Nature : _____ kg Cash : _____ FCF	 [_____] KG [_____] FCF	 [HDEBT1] [HDEBT2]
58	Have you mortgaged any land over the last 3 months? 00=No 01=Yes	[____]	[HMORTG]

SUPERVISOR NAME_____ SUPERVISOR SIGNATURE_____

DATE_____/_____/_____DD/MM/YYYY

SUPPLEMENT B2 Survey instrument used for quasi-experimental study in Tahoua, Niger (Chapter 3)

CONCERN worldwide

Programme FIM : Projet Cash Transfert

Questionnaire Nutrition, juillet 2012

Consentement

Bonjour. Je m'appelle _____. Nous réalisons actuellement une enquête sur la santé et la nutrition des enfants âgés de moins de deux ans pour le compte de l'ONG Concern. A cet effet, j'aimerais, si vous le permettiez, vous poser quelques questions. Pour la qualité de ce travail, il est très important que vous sachiez combien la sincérité de vos réponses compte sur les activités de l'ONG. C'est juste une enquête et non un ciblage de ménages vulnérables : vos réponses à ces questions ne feront pas de votre ménage bénéficiaire d'un quelconque appui / ne feront pas sortir votre ménage de la liste de bénéficiaires. Nous voulons dans la mesure du possible obtenir des réponses qui reflètent la situation réelle de votre ménage. Aussi, les mêmes enfants étudiés lors de cette évaluation seront revisités en fin août et fin septembre 2012.

Vous êtes libre de ne pas accepter si cela ne vous convient pas. Êtes-vous prêt à collaborer ?

Oui ☐ Non ☐

SI LE MENAGE N'ACCEPTE PAS, REMERCIER LE REPONDANT SANS COCHER ET CONTINUER JUSQU'A AVOIR UN AUTRE QUI ACCEPTE

Code enquêteur ☐☐ Date de l'enquête ☐☐.☐☐.☐☐

Identification du ménage

Village de : _____	Code de Ménage ☐☐
Catégorie du ménage : Cash ☐ Non Cash ☐	Nom chef du ménage : _____
Type de ménage : (Polygame=1 ; monogame=2) ☐	Ethnie des parents ☐ 1=Hausa ; 2=Touareg ; 3=Zarma/Songhai ; 4=Autres
Nom du/de la bénéficiaire : _____	N° carte bénéficiaire ☐☐☐ ☐☐☐

Identification de l'enfant du ménage inclus dans l'enquête

ASSUREZ VOUS D'ABORD QUE L'ENFANT N'EST PAS DANS UN PROGRAMME NUTRITIONNEL ET COMMENCER PAR VERIFIER SON STATUT NUTRITIONNEL. S'IL PRESENTE UN QUELCONQUE SIGNE DE MALNUTRITION, IL SERA EXCLU DE L'ENQUÊTE.

Nom enfant étudié : _____	Sexe (1=Masculin ; 2=Féminin) ☐
Date de naissance ☐☐.☐☐.☐	Age en mois ☐ ☐

Volet Anthropométrie et Alimentation des enfants 6-23 mois

Nom enfant : _____ Age en mois : ☐☐ Sexe (1=Masculin ; 2=Féminin) ☐

(Encercler les codes des réponses)

Q1 - PB (MUAC) en mm ☐☐☐ Q2 - Présence d'œdèmes *(Oui=1 ; Non=0)* 0 1

Q3 - Poids 00,0 kg ☐☐.☐ Q4 - Taille 00,0 cm ☐☐.☐

Q5 - Est-ce que vous avez allaité (nom) hier (24h)? *(Oui=1 ; Non=0)* 0 1

Q6 - A partir de quel âge avez-vous commencé à lui donné des aliments 0 1 2

et des liquides complémentaires ? *(0=Avant 6 mois ; 1=Entre 6 et 9 mois ; 2=10 mois et +)*

Q7 - Quel liquide autre que le lait maternel (NOM) a bu hier ? 0 1 2 3 4 5

0=Rien
1= Eau simple
2= Autre lait (frais, en boite, en poudre, …)
3= Jus de fruit
4= Boule ou bouille
5= Autres liquides

Q8 - Quels types d'aliments, lui avez-vous donnés les dernières 24h? *(Oui=1 ; Non=0)*

1. Légumineuses (niébé, haricots) et oléagineux (arachides) 0 1
2. Céréales (mil, riz, sorgho, mais, blé), racines (patates douces), tubercules (manioc) 0 1
3. Protéines animales : viandes, poissons, volailles 0 1
4. Œufs 0 1
5. Produits laitiers : lait frais, lait caillé, yaourt 0 1
6. Aliments riches en Vit A : légumes (carottes, courges) et fruits de couleur orange (oranges, mangue), feuilles vertes foncées (baobab, oseille, moringa), huile de palme 0 1
7. Autres légumes (aubergines) et fruits (bananes) 0 1

Q9 - Combien de fois a-t-il mangé les dernières 24H (repas et gouter)? ☐☐

Q10 - A-t-il/elle été malade dans les deux dernières semaines ? *(Oui=1 ; Non=0)* 0 1 => MALADIE

Volet Maladie

Q11 - De quelle maladie a souffert (nom) au cours des 2 dernières semaines? 1 2 3 4

1=Fièvre/convulsion/palu
2=Toux / difficulté respiratoire
3=Diarrhée
4=Autre maladie

Q12 - Où avez-vous cherché des soins lorsqu'il/elle a été malade ? 1 2 3 4 5 6 7 8

0=Pas cherché de soins
1= Hôpital
2= CSI
3= Case de santé
4=Cabinet/Clinique privée
5= Mamans lumière
6= Guérisseur traditionnel
7= Marchand ambulant
*8= Autre à préciser*_____

Q13 - Est-ce qu'il a reçu un traitement dans les 24H après le début de la maladie? (1=Oui; 0=Non)

0 1

Q14 - Durant la maladie, quelle quantité de liquide lui avez-vous donnée?

1 2 3 4

1. Moins que d'habitude
2. Même que d'habitude
3. Plus que d'habitude
4. Non Applicable

Q15 - Durant la maladie, quelle quantité d'aliments lui avez-vous donnée?

1 2 3 4

1. Moins que d'habitude
2. Même que d'habitude
3. Plus que d'habitude
4. Non Applicable

Volet Prévention des maladies

Q16 - Est-ce que (nom) a passé la nuit sous une moustiquaire hier nuit

0 1 2

0=Non
1=Moustiquaire simple
2=Moustiquaire imprégnée

Q17 - (Nom) a-t-il reçu les vaccinations suivantes (0=Non ; 1=Vu dans carnet ; 2=Oui selon la mère ; 3=NSP)

Rougeole 0 1 2 3
Penta 3 0 1 2 3
Vitamine A 0 1 2 3

Q18 - (Mère/tutrice) Avez-vous lavé vos mains avec savon/cendre hier? (1=Oui; 0=Non)

0 1

Q19 - Si Oui, c'est à quelle occasion?

1 2 3 4 5 6

(1=Avant de préparer repas ;2=Avant de donner à manger aux enfants ; 3=Après être allé à la selle ; 4=Après avoir nettoyé un enfant qui a déféqué, 5=Après repas ; 6=Autres)

Question sur la sécurité alimentaire et l'utilisation du cash

	Moyens de subsistance du Ménage - Quel type et nombre possède le ménage ?	1=Bovin |____| 2=Caprin |____| 3=Ovin |____| 4=Volailles |____| 5=Camelin |____| 6=Asin |____| 7=Equin |____| 8= Terre en Ha |____| 9= Autres |_____|

Quelle est la profession du chef de ménage? (Cochez X selon le cas, plusieurs cas peuvent être cochés)

Profession						
Cultivateur	Eleveur	Artisan	Commerçant	Travailleur journalier	Employé régulier	Autres (spécifier)
|_____|	|_____|	|_____|	|_____|	|_____|	|_____|	|_____|

	Quelles sont les principales sources de revenus de votre ménage actuellement?	1ère plus importante	|__|__| ……
		2ième plus importante	|__|__| ……

		3ième plus importante	|___|___| ……
		1 = Vente bétail 2 = Production agricole 3= Petit commerce 4= Transferts (projet) 5=Transfert migrants 6= Emprunts	7= Assistance extérieur 8 = Vente de produits d'élevage 9= Vente bois de chauffe/paille 10 = Mendicité 11 = Vente de force de travail 12 = Autres (à préciser sur la ligne)

	Comment avez-vous utilisé l'argent reçu ?	Achat des vivres pour le ménage	/___/____/____/____/____/
		Achat des vivres pour les enfants de 6 à 23 mois	/___/____/____/____/____/
		Payé pour des services de santé	/___/____/____/____/____/
		Cérémonies / funérailles / festivités	/___/____/____/____/____/
		Éducation des enfants	/___/____/____/____/____/
		Partage avec autrui	/___/____/____/____/____/
		Achat de savon	/___/____/____/____/____/
		Pas dépensé encore	/___/____/____/____/____/
		Communication	/___/____/____/____/____/
		Achat d'animaux	/___/____/____/____/____/
		Achat de vêtements	/___/____/____/____/____/
		Paiement d'impôt/taxes	/___/____/____/____/____/
		Rembourser des dettes	/___/____/____/____/____/
		Achat de Condiments	/___/____/____/____/____/
		Autre, préciser _____	/___/____/____/____/____/
		Total	/___/____/____/____/____/

	Qui prend la décision d'utiliser l'argent du cash ?	Vous Votre époux Vos parents Quelqu'un d'autres (à préciser) …….. |_____|
	Avez-vous partagé l'argent avec un autre ménage	Oui Non |_____|
	Si *oui*, pourquoi ?	Volontaire (solidarité) Imposé |_____|
	L'argent reçu lors de la distribution a permis de couvrir les dépenses alimentaires de votre ménage pendant combien de jours?	|_____|_____|
	Pensez-vous que le cash que vous recevez permet d'améliorer la santé de votre enfant ?	1. Oui 2. Non |_____|
	Expliquer pourquoi votre réponse à la question précédente ?	

PRENDRE SOINS DE VERIFIER LA COMPLETUDE ET LA COHERENCE DES REPONSES AVANT DE QUITTER LE MENAGE.
REMERCIER LA REPONDANTE POUR SA COLLABORATION

SUPPLEMENT B3 Survey instrument used for cross-sectional study in Marsabit County, Kenya (Chapter 4)

ACCESS STUDY: MARSABIT COUNTY FACILITY SURVEY

Check Eligibility
- Female caregiver at least 18 years old
- With a child 6-59 months old at the facility on a survey day
- Has not previously participated in this survey

Check that the participant agrees to participant. Read to participant:
Hello. My name is [CHW name]. This survey is being conducted to understand caregivers' practices in bringing children to the health facility. If you agree to participate in this survey, I will ask you questions about you, your child, and your experiences coming to this facility. It is important that you answer all questions sincerely and completely. You are free to decline participation, and there are no consequences for declining. Would you like to participate?
Tunin qorqorti waan guba galfacha/ubanot karaa aka awan/qorqoratan ijole min qorsa/sibital gesu. Yoo atin fudacha qorqorti tana qabate, anini gafacha galfacha waan guba sii, ijole amale bekh kanke guba min qorsa/sibitala qab, Yoo fudate, gafitan dhebisan gudo dansa kara dugaa amale gutama tin. Atin didat jirt aka gafitan debiftu, amale murti tan bufachiti churdami injir. Gafitan debisu feta?
Consent Obtained: Yes No
If yes, continue with survey. If No, thank the individual and allow them to go.

1. Survey number
   [ ]

2. Today's date (DD/MM/YYY)
   [/ / 2013]

3. District and Facility

1 Marsabit Central	**2 Moyale**	**3 Sololo**
a. Badassa	a. Butiye	a. Ambalo
b. Dakabaricha	b. Dabel	b. Dambal Fachana
c. Dirib Gombo	c. Moyale District Hospital	c. Karbururi
d. Hulahula	d. Nana	d. Sololo Mission Hospital
e. Karare	e. Odda	e. Walda
f. Marsabit District Hospital	f. Yabello	f. Wayegodha

I. CHILD HEALTH AND NUTRITION STATUS

4. Was your child assessed today for MUAC, weight, and/or height?

No (0) → Measure child MUAC and enter in table below Yes (1) → Ask to see the health card. Copy MUAC, weight, height, etc. from health card in table below

a. Child MUAC (cm)	_ _ _ . _
b. Child Weight (kg)	_ _ . _
c. Child Height (cm)	_ _ _ . _
d. Edema	No (0) Yes (1)

5. CHW- Circle **ONE** group: the appropriate group based on MUAC.

1 Severe acute malnutrition (MUAC <11.5) = **SAM GROUP** 2 Moderate acute malnutrition (MUAC <12.5) = **MAM GROUP** 3 Normal (MUAC >12.5) = **OTHER GROUP**

6. CHW- From health card or caregiver, obtain:

a. Child sex	Male (0) Female (1)
b. Child date of birth (DD/MM/YYYY)	/ /
c. Child age (months)	

7. Is the child enrolled in the OTP program?

No (0) Yes (1)

8. Is the child enrolled in the SFP program?

No (0) Yes (1)

9. Has the child dropped out of the OTP or SFP program and is just returning today?

No (0) Yes (1)

10. Do you currently notice any signs/symptoms of illness in your child? / *Ijolen qanofte garte enani maan irat gart?*

No, child seems healthy to woman. (0) →Continue to question 11.

Yes (1) →Go to sub-questions "a" and "b" and "c"

a. Sub- question "a". **If yes**, which signs do you notice?
(**Circle all that apply. DO NOT LIST**. Ask "anything else?")

1	Diarrhea- *Albati*
2	Cough- *Qufasu*
3	Fever- *Qanno*
4	Vomiting- *Didiq*
5	Difficulty breathing- *Hafur bafachu dadabd*
6	Blood in stools or urine- *Dig udhani fi funchan kesa*
7	Injury/bitten/infection -*Madha fi dukub gogaa (muram, gubatu, chapa lafe)*
8	Not eating- *Inyat*
9	Not drinking- *Induth*
10	Lost weight/looked thin- *Kilo/ulfin dabde*
11	Swollen belly- *Garaat guddat*
12	Wrinkly skin- *Sukhi gogaa*
13	Swollen ankles or feet
14	Crying- *Imbot*
15	Seemed different- *Tafot qadb*
16	Other (Specify)
17	Other (Specify)

b. Sub question "b". How many days has your child shown these symptoms?

Number of days

c. Sub question "c". After you noticed these symptoms, how many days did you wait before you brought your child here to the clinic?

Number of days

II. CAREGIVER & HOUSEHOLD CHARACTERISTICS

11. What is your relationship to the child you brought today? (**Circle one**). / *Ijolen atin araa duften maan kanke?*

1	Mother- *Ayo*
2	Aunt- *Areya*
3	Sister- *Atha*
4	Grandmother- *Ako*
5	Mother-in-Law- *Sotha*
6	Neighbor- *Olla*
7	Other (specify)

12. Can you please tell me your age?? / *Gaani khe agam? (Gaan)*

Years

13. What is your marital status? / *Si fudani, fud akami?*

1	Married- *Yaa fudan*
2	Married polygamous- *Masanu qabda*
3	Divorced- *Jalabate*
4	Separated/Living apart- *Gargarbatani/Dulafula jirtani*
5	Widowed- *Dirs inqabdu*
6	Never Married- *Taka ifune*
7	Other (specify)

14. What is your highest level of education/schooling? / *Masomo/Baranot/Tamari esan baft?*

1	No education- *Insomne/Intamar*
2	Informal education/Koranic school- *Gumbaro/Skul Diini*
3	Primary education- *Min toko aga sadheti*
4	Secondary education- *Sokondari*
5	Higher education- *Yunifasiti/Colleji/ Baranot fag*at
6	Other (Specify)

15. What is your ethnicity? / *Gosti tante maan*?

1	Borana
2	Gabra
3	Rendille
4	Burji
5	Samburu
6	Other (Specify)

16. Which of these best describes your household? / *Waani kuni kamit fin/amal worketi garsis?*

1	Resident- *Teso*
2	Refugee- *Baqata/Teso inqab*
3	Visitor- *Kesuma*
4	Nomad/Pastoralist- *Wor godhan*
5	Other (Specify)

17. How many people live in your household (the same compound) including you and your child? / *Naam agamit min kheti gal, sii amale ijole tetin wolt?*

Number of people in household

18. How many children in your household are under the age of 5, including this child? / *Naam agamit gaan shani (5) jal*?

Number of children under age of 5

19. What village do you currently reside in? / *Ollan khe kaam*?

Village name

20. How much time did it take you to come to the clinic today? / *Yoo setu gise agam fudat min qorsa kanan bau arr?*

Number of hours
Number of minutes

21. Approximately how far is your village from the clinic? (CHW may estimate).

Number of kilometers
Number of meters

22. What **THREE** activities take up the MOST of your time each day? (**Circle THREE**.) / *Fin wor kheti gudan esa bay*? Herding animals- *Fin ori qencha*

1	Farming food crops- *Fin obru nyata obratan*
2	Farming cash crops- *Fin obru gurgura obratan*
3	Paid labor- *Uji silkala/kira*
4	Commerce/Small business- *Beshara/beshara didiqo*
5	Housework (cooking, cleaning)
6	Fetching wood
7	Fetching water
8	Child care
9	Other (Specify)
10	Other (Specify)
11	Other (Specify)

23. What **ONE** activity provides the MOST income for your household? (**Circle ONE.**) / *Fin kaan kesa worri khe kamin gudo fidamt?*

1	Sale of livestock- *Gurgur ori*
2	Sale of crops- *Gurgur obru*
3	Sale of grass- *Gurgur marra*
4	Sale of milk
5	Sale of miraa
6	Sale of firewood
7	Sale of charcoal
8	Paid labor- *Ugi bese*
9	Commerce/Small business- *Beshara*
10	Remittances- *Keni*
11	Loans
12	Begging- *Kadha*
13	Humanitarian aid- *Qarwqara ala*
14	Other (Specify)

24. What animals do you possess, and how many of each? / *Worri khe ori qencha qaba?*

a. None- *Iyoo*
b. Number of Chickens- *Luku agam*
c. Number of Goats- *Lales agam*
d. Number of Sheep- *Olich agam*
e. Number of Donkeys- *Arre agam*
f. Number of Cattle- *Loon agam*
g. Number of Camels- *Gaal agam*
h. Other (Specify)

25. Which of these items does your household possess? (**Circle all that apply**. **PROVIDE LIST**.) / *Waani kunin kaam wori khe qab*?

a. Lantern- *Lampadi/Ibse/Fanus/Taa*	No (0)	Yes (1)
b. Cart- *Mokoketeni/Kareta*	No (0)	Yes (1)
c. Hoe or Axe- *Dagara/shoka*	No (0)	Yes (1)
d. Clock or watch - *Sadhi/Satil*	No (0)	Yes (1)
e. Radio - *Tapi/Redhio*	No (0)	Yes (1)
f. Television- *Tivi/Tifi/Selema*	No (0)	Yes (1)
g. Car battery- *Daka tochi/Batiri*	No (0)	Yes (1)
h. Electricity- *Sitima/Ibse*	No (0)	Yes (1)
i. Generator- *Mashin dibisu/Genreta*	No (0)	Yes (1)
j. Tape player- *Kaseed*	No (0)	Yes (1)
k. Bicycle- *Biskili*	No (0)	Yes (1)
l. Motorcycle- *Biqbiqi*	No (0)	Yes (1)
m. Telephone/cell phone- *Simu*	No (0)	Yes (1)
n. Tin roof - *Qorqoro/babati*	No (0)	Yes (1)
o. Latrine- *Shoo*	No (0)	Yes (1)
p. Running water- *Feregi*	No (0)	Yes (1)
q. Mosquito net- *Sandarwa*	No (0)	Yes (1)

26. During the last 4 weeks, was there a time when…/ *Bulti Torban afuri ta dabart kesat, guyan bese amale hark dikenaf…* (**ASK EACH QUESTION IN BOX).**

a. You were unable to eat healthy and nutritious foods, like milk, meat, eggs, green vegetables, or fruit?	No (0)	Yes (1)
b. You worried you might run out of food?	No (0)	Yes (1)
c. There was no food to eat in your household?	No (0)	Yes (1)
d. You or any household member went to sleep at night hungry because there was not enough food?	No (0)	Yes (1)
e. Your or any household member went a whole day and night without eating anything because there was not enough food?	No (0)	Yes (1)

III. ACCESS TO THE CLINIC

27. What was the **primary** purpose of your visit to the clinic today? (**Circle ONE.**) / *Waani at min qorsa/Sibital demtuf maan arr?*

1	Child seemed unwell/ill- *Ijolen qanofte gart*
2	Child seemed malnourished
3	Child was injured/bitten/infection- *Ijolen madoft*
4	Attend SFP- *Sagale ijole yartu/qaqallo fudacha duft*
5	Attend OTP- *Uji ijole fudacha duft*
6	Vaccinations/Immunizations- *Talala*
7	Growth monitoring- *Ilalcha gudhina*
8	Assistance with breastfeeding
9	Family planning
10	For a meeting
11	Neighbor or family member advised me to come- *Wor olla koot naan gede*
12	Community health worker advised me to come- *Wor sibitala kaa wor kesat koot naan gede*
13	Other (Specify)

28. Did you feel uncomfortable about your purpose for coming to the clinic today?

No (0)	Yes (1)

a. **If Yes**, how uncomfortable did you feel about your purpose for coming today?

1	2	3	4
Not very uncomfortable	A little uncomfortable	Uncomfortable	Very uncomfortable

29. Did you need permission from your husband to come to the clinic today?

No (0)	Yes (1)

30. Did you need permission from your mother-in-law to come to the clinic today?

No (0)	Yes (1)

31. What other places or people to you usually go to for health care for your child? (**Circle all that apply.**") / *Fullan dibin yokhan name atin gart atho sibital indufinu jira?* No other places or people- *Toklen injiru*

1	Self/home treatment/family- *Anum/chiruma minat/worken*
2	Traditional healer/herbalist- *Chirres*
3	Spiritual healer- *Chirres dini*
4	Community health worker- *Naam sibitala kaa gara wora*
5	Pharmacy/chemist- *Fulla qors it gurguran*
6	Other public health clinic, center, or hospital- *Sibital sirkala*
7	Private clinic or private hospital- *Sibital cliniki*
8	Other (Specify)

32. **Think about the women in your community and this clinic. In general**, what prevents a woman from bringing her child to the clinic? What are the most common reasons why a woman cannot come, or decides not to come? What makes it unlikely that a woman will come? / *Kara gababan wuni dufu naam dowa kunin maan aka at arr duftef kunini?*
(**Circle THREE. DO NOT LIST**. "Anything else?")

Distance/Travel/Time
1 Clinic is too far away- *sibitali/clinikin fagoo*
2 Travel to the clinic costs too much- *gatin sibitalan daqan gudho*
3 Travel to the clinic takes too much time- *gisen sibitalan daqan gudho*
4 Travel to the clinic isn't safe- *deman cliniki sodha*
5 No road/ no transport to the clinic
6 No time because of work at home- *gisen injirtu sabab ujiti*
7 No time because of child care at home- *gisen injirtu sabab qorqorti ijole tif*
8 Weather- *qilles lafa*

Knowledge
9 Prefers other source
10 Doesn't know where to go- *fula dem imbekhu*
11 Didn't know child was ill- *faydab ijole imbekhu*
12 Doesn't think/know condition is severe- *dib guda inseru*
13 Fears child will be rejected- *detta ijole fa didhani*
14 Doesn't think treatment will help- *qarqars sibitala imbekhu*
15 Can manage the problem at home

Social or Cultural
16 Feels shy, embarrassed, or ashamed- *fokifade amale cherfad*
17 No one to help at home while away
18 No one to travel with- *nami waela injiru*
19 Husband doesn't allow/must give permission- *dirsi fudacha inqab*
20 Mother-in-law doesn't allow- *ati sotha fudacha inqabdu*
21 A holiday or event- *liff yokhan jiil*
22 People will talk about them/doesn't want people to know
23 Cannot leave home after birth

Clinic Issues
24 Treatment costs too much- *gatin sibitala gudho*
25 Clinic is often closed- *kilinikin yoefhu idas*
26 Clinic often lacks the medicine- *kilinijin yoedhu qors inqabd*
27 Clinic staff are harsh- *wori kiliniki dansani*
28 Clinic lacks electricity/water- *kilinikin bisani fi sitima inqabd*
29 Waiting time too long- *gisen egan deertu*
30 Uncomfortable at the clinic- *dansa indagau clinikit*

Other
31 No barriers- *diibi injiru*
32 Doesn't know- *imbekhu*
33 Other (Specify) _____
34 Other (Specify) _____

33. Think about **YOUR** purpose for coming to the clinic **TODAY.** What makes it hard for **YOU** to come to the clinic? Pick the **THREE MOST IMPORTANT REASONS**. / *Yoo atin kiliniki dema fikirte araa, dib gudan at argachan uff setu kaam? Kadan tiy gudhon,*
(**Circle THREE. DO NOT LIST**. "Anything else?")

Distance/Travel/Time
- 1 Clinic is too far away- *sibitali/clinikin fagoo*
- 2 Travel to the clinic costs too much- *gatin sibitalan daqan gudho*
- 3 Travel to the clinic takes too much time- *gisen sibitalan daqan gudho*
- 4 Travel to the clinic isn't safe- *deman cliniki sodha*
- 5 No road/ no transport to the clinic
- 6 No time because of work at home- *gisen injirtu sabab ujiti*
- 7 No time because of child care at home- *gisen injirtu sabab qorqorti ijole tif*
- 8 Weather- *qilles lafa*

Knowledge
- 9 Prefers other source
- 10 Doesn't know where to go- *fula dem imbekhu*
- 11 Didn't know child was ill- *faydab ijole imbekhu*
- 12 Doesn't think/know condition is severe- *dib guda inseru*
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- 16 Feels shy, embarrassed, or ashamed- *fokifade amale cherfad*
- 17 No one to help at home while away
- 18 No one to travel with- *nami waela injiru*
- 19 Husband doesn't allow/must give permission - *dirsi fudacha inqab*
- 20 Mother-in-law doesn't allow- *ati sotha fudacha inqabdu*
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Clinic Issues
- 24 Treatment costs too much- *gatin sibitala gudho*
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- 26 Clinic often lacks the medicine- *kilinijin yoedhu qors inqabd*
- 27 Clinic staff are harsh- *wori kiliniki dansani*
- 28 Clinic lacks electricity/water- *kilinikin bisani fi sitima inqabd*
- 29 Waiting time too long- *gisen egan deertu*
- 30 Uncomfortable at the clinic- *dansa indagau clinikit*

Other
- 31 No barriers- *diibi injiru*
- 32 Doesn't know- *imbekhu*
- 33 Other (Specify) _____
- 34 Other (Specify) _____

34. **Think about child malnutrition (wasting).** Do you think that women whose children are malnourished feel **more uncomfortable** (**worried, unhappy**) to come to the clinic than other women?

No, they feel the same as other women (0) → Continue to question 35. Yes, they feel more uncomfortable (1) → Go to sub-question "a".

a. Sub question "a": **Why** do you think women whose children are malnourished feel more **uncomfortable** (**worried, unhappy**) to come to the clinic?

(**Circle all that apply. DO NOT LIST**. "Anything else?")

1	It means they don't have enough food in their household for the child
2	It means they cannot provide for their child
3	It means they don't take good care of their child
4	It means that their child is ill with something very serious
5	It means that their household is very poor or unclean
6	They are embarrassed/ ashamed
7	Other (Specify) _____
8	Other (Specify) _____
9	Other (Specify) _____

35. **Compared to other illnesses**, how **difficult** is it for a mother **to recognize** malnutrition?
*Wolt laal dukub dibin, Agaam **jajabdhu** ka awaan qalin/sagal diqen ijole ufi ingar?*

0	1	2	3	4
Don't know (*imbekhu*)	Easier (*jaben diqa)*	The same (*agumtaka*)	More difficult (*jajabdhu)*	Much more difficult (*aka gudha jajabdu)*

36. **Compared to other illnesses**, how **serious** is malnutrition?
*Wolt laal dukub dibin, Agaam **amtu** sagal diqeni?*

0	1	2	3	4
Don't know (*imbekhu*)	Less serious (*amen diqa)*	The same (*agumtaka*)	More serious (*amtu)*	Much more serious (*aka gudha amtu*)

37. **Compared to other illnesses**, how cautious/reluctant are **Husbands** about sending their child to a clinic for malnutrition?

0	1	2	3	4
Don't know (*imbekhu*)	Less cautious	The same (*agumtaka*)	More cautious	Very cautious

38. Compared to other illnesses, how cautious/reluctant are **Mothers-in-Law** to send a child to a clinic for malnutrition?

0	1	2	3	4
Don't know (*imbekhu*)	Less cautious	The same (*agumtaka*)	More cautious	Very cautious

39. Compared to other illnesses, how cautious/reluctant are **Mothers** to bring their own child to a clinic for malnutrition?

0	1	2	3	4
Don't know (*imbekhu*)	Less cautious	The same (*agumtaka*)	More cautious	Very cautious

40. **Finally, think about the clinic, your life, and the people in your life. What would make it EASIER for you to bring your child to the clinic?**
(**Circle THREE. DO NOT LIST**. "Anything else?")

Distance/Travel/Time
- 1 If the clinic was closer
- 2 If travel was safer
- 3 If the transport was better/faster/easier
- 4 If I had more free time

Knowledge
- 5 If I knew where to go
- 6 If I knew my child was ill/serious
- 7 If I knew the child would be admitted
- 8 If treatment were more successful

Social or Cultural
- 9 If I weren't embarrassed/ashamed
- 10 If I had help at home
- 11 If I had people to travel with
- 12 If my husband or mother in law allowed
- 13 If people supported me/encouraged me

Clinic Issues
- 14 If treatment were cheaper
- 15 If the clinic were open
- 16 If the clinic had the medicine
- 17 If the clinic staff were friendlier
- 18 If the clinic had water/electricity
- 19 If I didn't have to wait long

Other
- 20 Nothing could be better
- 21 Don't know- *imbekhu*
- 22 Other (Specify) _____
- 23 Other (Specify) _____
- 24 Other (Specify) _____
- 25 Other (Specify) _____

End of survey- thank the participant and allow her to go.

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